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# Theory and Construction Methods for Large Regular Resolution IV Designs

A Dissertation

Presented for the

Doctor of Philosophy

Degree

University of Tennessee, Knoxville

Robert M. Block

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**Dedication**

To my family, thank you for all the love and support.

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**Abstract**

We define $2^{k-p}$ fractional factorial designs which use all of their degrees of freedom to estimate main effects and two-factor interactions as *second order saturated* (sos) designs. We prove that resolution IV sos designs project to every other resolution IV design, and show the details of these projections for every $n = 32$ and $n = 64$ run fraction. For $k > (5/16)n$, all resolution IV designs are a projection from the even sos design at $k = n/2$. For $k \leq (5/16)n$ the minimum aberration design resolution IV designs are projections of sos designs with both even and odd words in the defining relation. While even resolution IV designs are limited to estimating fewer than $n/2$ two-factor interactions (in addition to the $k$ main effects), resolution IV designs with odd-length words in the defining relation may devote more than half of their degrees of freedom to two-factor interactions. We propose a method to search for good resolution IV designs using naïve projections from even/odd sos designs. We introduce the alias length pattern as a tool to help characterize designs. We describe how the matrix $T = DD'$ for a design $D$ is useful in searching for designs. We list the resolution IV even/odd minimum aberration designs for $n = 128$ and provide a catalog of the best resolution IV even/odd designs for $n = 128$. These results are based on an isomorphic check using a convenient function of $T$, as well as the set of projections of a design. Finally, we suggest a new method for finding good regular resolution IV designs for large $n$ ($> 128$) and provide a preliminary table of good resolution IV even/odd designs for $n = 256$.

Key words: alias length pattern, defining contrast subgroup, Hamming distance matrix, isomorphism, minimum aberration, projection, regular designs, word length pattern.

**Disclaimer**

The views expressed in this dissertation are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the U.S. Government.

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## 1. Introduction

Two-level fractional factorial designs are widely used to investigate the effect of large numbers of parameters for complex computer models. Each parameter is varied over a high and low setting of possible operating conditions to build a model to help explain the relationship of the parameters to the outcome of the computer model. A $2^{k-p}$ fractional factorial design with $k$ parameters or factors at two levels will consist of $n = 2^{k-p}$ runs. This design is a $2^{-p}$th fraction of the $2^k$ full factorial design where the fraction is determined by $p$ defining words. A "word" consists of "letters" which are the names of the factors denoted by A, B, ... (or 1, 2, ...,). The number of letters in a word is the word length. The group formed by the $p$ defining words and their generalized interactions is called the defining contrast subgroup (Wu and Hamada 2000, p.157). The defining contrast subgroup consists of $2^p$ -1 words plus the identity column (commonly denoted as I). The defining contrast subgroup can be used to study all the aliasing relations among effects.

Every regular design can be categorized by the word length pattern of its defining contrast subgroup. For a $2^{k-p}$ design, let $w_i$ denote the number of words of length $i$ in its defining contrast subgroup. The vector $wlp = (w_1, \ldots, w_k)$ is called the word length pattern of the design. The resolution of a $2^{k-p}$ design is defined to be the smallest $r$ such that $w_r \geq 1$. This means the length of the shortest word defines the resolution. Box and Hunter (1961) proposed the maximum resolution criterion as a method to categorize and compare designs. Later, Fries and Hunter (1980) introduced the minimum aberration criteria. This criterion allows any two designs to be rank ordered according to their word

length patterns. This is the most common criterion used today to judge the goodness of designs.

In addition to wlp, we introduce a new criterion based on the alias length pattern to help find and characterize resolution IV designs. We define the alias length pattern as the frequencies of the lengths of the alias sets for two-factor interactions: $\text{alp}=(a_1,a_2,\ldots,a_l)$ where $a_1$ is the number of clear two-factor interactions, $a_2$ is the number of pairs of aliased two-factor interactions, etc., up to $a_l$ which is the number of the largest set of $l$ aliased two-factor interactions $\left(l \le \left\lfloor \frac{k}{2} \right\rfloor\right)$, we define this value as $L_{\max}$. The alias length pattern (alp) also contains other important information:

- The number of degrees of freedom for two-factor interactions: $\sum_{i=1}^{l} a_i$
- The number of length four words in the defining relation: $w_4 = \sum_{i=2}^{l} \binom{i}{2} a_i / 3$.

All regular $2_{IV}^{k-p}$ designs of size $n = 64$ or less have been identified previously; see Chen, Sun and Wu (CSW) (1993) and Sun (2001). However, for $n = 128$, all possible resolution IV designs have not been identified. Butler (2003) provided theory for constructing regular minimum aberration designs with $n$ runs and $5n/16 < k < n$ factors. We have identified all remaining minimum aberration designs for $n = 128$, that is, for $k \le 5n/16$.

For cases with $n = 128$ or more, search algorithms are currently used to identify attractive fractional factorial designs having the specified size and other characteristics.

For example, PROC FACTEX in SAS/QC® software (SAS Institute Inc., 1999) searches for minimum aberration designs for any given $k < 2^r$. However, due to the magnitude of the computation for large $n$ and certain values of $k$, exhaustive searches are not feasible given current computing speeds. The FACTEX procedure returns the best design it finds in the allotted search time. It does not necessarily find the minimum aberration design. This paper will propose an alternative search method for tabulating good designs for $n$ = 256 and larger.

It is well known that, for $k \le n/2$ factors and $n$ = 8, 16, 24, 32, …, there exist resolution IV designs. When $k = n/2$, the design is known as a *minimal design* of resolution IV (Montgomery 2001, p. 347). These minimal designs may be obtained by foldover of a saturated orthogonal main effects design of size $n/2$. For any $n = 2^r$ (with $r \ge 3$), a regular minimal design may be constructed by using all the odd interactions of the $r$ basic columns as generators. For example, for $r = 5$, the 11 generators for the $2_{IV}^{16-11}$ design are the $\binom{5}{3} = 10$ three-factor interactions and the single five-factor interaction. Alternatively one may arrange the $n - 1$ columns of a saturated main effects design in Yates order (e.g., see Appendix A), and:

- select every other column starting with the first or
- select the last $n/2$ columns.

Li and Mee (2002) present an alternative set of $n/2$ columns to create this minimal design. For the remainder of this article, we restrict our attention to regular resolution IV designs.

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The minimal $2_{IV}^{k-p}$ designs are even designs, in that every word in the defining relation is of even length. Li and Mee (2002) showed that every $2_{IV}^{k-p}$ design with $5n/16 < k \leq n/2$ must be an even design. Even designs:

- alias even effects with other even effects, and odd effects with odd.
- allocate $n/2$ degrees of freedom to odd effects, and $n/2 - 1$ degrees of freedom to even effects
- provide at most $n/2 - 1$ degrees of freedom for estimating two-factor interactions, and at least $n/2 - k$ degrees of freedom for three-factor or higher-order interactions.

For instance, the minimum aberration $2_{IV}^{11-6}$ design - an even design – permits estimation of 11 main effects, 15 two-factor interactions, while leaving five degrees of freedom for aliased three-factor interactions.

By contrast, $2_{IV}^{k-p}$ designs with half of the words in the defining relation with odd length may provide more than $n/2 - 1$ degrees of freedom for two-factor interactions. For instance, the minimum aberration $2_{IV}^{10-5}$ design supports estimation of all 10 main effects and 21 two-factor interactions. Because of this greater capacity for estimating two-factor interactions, this work will focus on the construction of even/odd $2_{IV}^{k-p}$ designs. While such designs do not exist for $n = 16$ and are rather rare for $n = 32$, even/odd designs are common for larger $n$ if $k \leq 5n/16$.

One of the challenging aspects of searching for new designs is determining when two designs are equivalent or isomorphic. (Two designs are isomorphic if the defining relation of one can be mapped into the defining relation of the other through a relabeling

of the factors and level exchanges.) Draper and Mitchell (1967, 1968, 1970) wrote a series of three articles which used an algorithm to determine isomorphic designs. Their original method, called "sequential conjecture" (1967) found a relabeling map for isomorphic designs. They noted in their next paper (1968) that word length pattern did not uniquely identify designs but it provided an alternative to their permutation subroutine (sequential conjecture procedure) for testing isomorphic designs when the time required to conduct the isomorphic checks become prohibitive. The trade-off of using word length pattern is that the designs found may not be a complete set. Draper and Mitchell (1970) introduced the "letter pattern comparison" (now commonly known as the letter pattern matrix) as a way to identify designs instead of the computationally burdensome sequential conjecture procedure. They make the conjecture that the letter pattern matrix approach uniquely determines designs. Chen and Lin (1991) provide a counter-example to this conjecture. Additional counter-examples appear later in section 11 in this dissertation.

Chen, Sun, and Wu (1993) developed an algorithm for constructing regular fractional factorial designs that required a complete mapping for each design that shared word length pattern. This method insured that no non-isomorphic designs were lost, but became computationally infeasible for $n = 128$ or larger.

Sun, Li, and Ye (2002) proposed a sequential method for constructing non-isomorphic orthogonal designs and an algorithm for detecting isomorphic designs for both regular and non-regular designs. Their algorithm is based on the concept of *minimal column base*. A column base is a subset of columns of a design, such that no two rows are identical to each other. A minimal column base is the smallest possible number of

columns for a given design. Sun, Li, and Ye check the mapping for the minimal column bases for two designs with the same word length pattern. They repeat this until an isomorphic mapping is found or all the possible minimal bases for the two designs have been checked. See Sun, Li, and Ye (2002) for details. This method is successful for both regular and non-regular designs and especially useful for designs with small $n$.

In the following section, we focus on the structure of even/odd resolution IV designs of size 32 and 64. We use these known cases to introduce some definitions and indicate the structure one could exploit in the larger cases where all designs are not known.

## 2. Resolution IV Designs of Size 32 and 64

Only five even/odd $2_{IV}^{k-p}$ designs of size 32 exist; refer to Table 2.1. For convenience, we use Chen, Sun, and Wu's method of labeling designs where 10-5.1 designates the first (best) 32 run design with ten factors and five generators. Two of these designs (10-5.1 and 9-4.2) utilize all 31 degrees of freedom for estimating main effects and two-factor interactions. We will refer to any $2_{IV}^{k-p}$ design (both even and even/odd designs) that uses all of its degrees of freedom for estimating main effects and two-factor interactions as a *second order saturated* (*sos*) *design*. Each of the non-sos designs is a projection of at least one of these sos designs. For instance, delete any column from 10-5.1 and one obtains design 9-4.1.

Theorem 2.1: Every $2^{k-p}$ non-sos resolution IV design is the projection of at least one sos resolution IV parent design.

Suppose there exists a $2_{IV}^{k-p}$ non-sos design. A non-sos design is defined as a design that does not utilize all $2^{k-p} - 1$ degrees of freedom for estimating main effects and two-factor interactions.

**Table 2.1: Even-Odd Resolution IV Designs of Size 32**

| Design | Generators | df | wlp | alp | E/O Projections |
|---|---|---|---|---|---|
| 10-5.1 | 7, 11, 19, 29, 30 | 31 | 10,16,0,0,5 | 0,20,0,0,1 | 9-4.1 |
| 9-4.1 | 7, 11, 29, 30 | 30 | 6,8,0,0,1 | 8,12,0,1 | 8-3.1 |
| 9-4.2 | 7, 11, 13, 30 | 31 | 7,7,0,0,0,1 | 15,0,7 | 8-3.1 |
| 8-3.1 | 7,11,29 | 29 | 3,4 | 13,6,1 | 7-2.1 |
| 7-2.1 | 7, 27 | 25 | 1,2 | 15,3 | |

A non-sos design therefore has "available columns" for the unused degrees of freedom. An available column is any column that is not aliased with a main effect or two-factor interaction.

Suppose we add a new factor to our design, with an available column as its generator. The new factor "$z$" multiplied by its generator will appear as an additional word in the defining contrast subgroup. The new word is necessarily of length four or more and the resulting design with $k + 1$ factors must be resolution IV for the reason given below.

Suppose it is not resolution IV; then this would mean there is a word in the defining contrast subgroup of length three or less. This implies that a new word contains $z$ (since $z$ appears in all the new words) plus two or fewer other letters. This implies that $z$ is aliased with either a main effect or two-factor interaction, which contradicts the fact that the generator was an "available column". Therefore the resulting $k + 1$ factor design must be resolution IV.

Now this $k + 1$ factor resolution IV design is either a second order saturated design with no more available columns, or a non-sos design with an available column. If not sos, the process can be repeated until the design becomes a second order saturated design. Therefore, all non-sos $2_{IV}^{k-p}$ designs have at least one resolution IV sos parent.

Corollary 2.1: All non-sos even/odd resolution IV designs are the projection of an even/odd resolution IV sos design.

Even/odd designs may project to either an even design or an even/odd design while even designs only project to other even designs (see Figure 2.1).

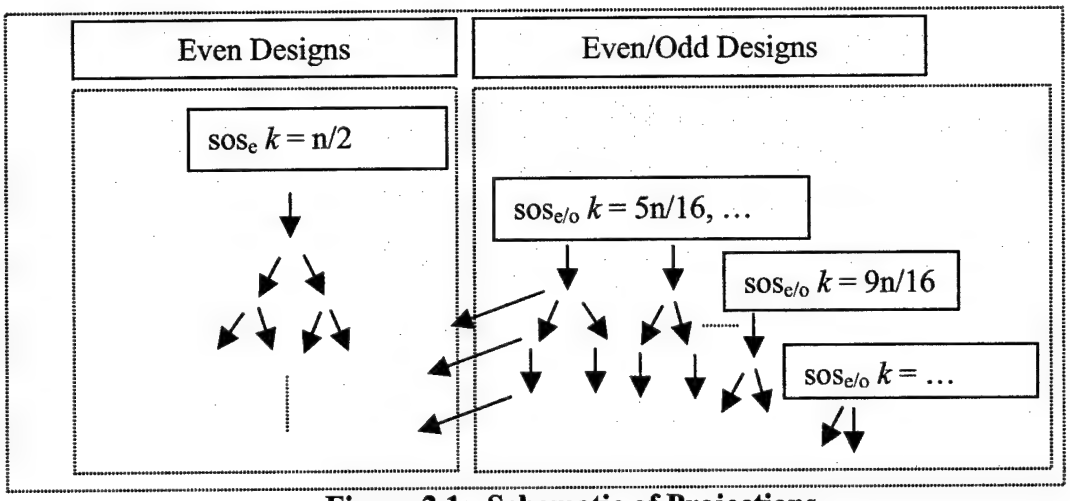


**Figure 2.1: Schematic of Projections**

Lemma 2.1: If the delete-one-column projections of an even/odd resolution IV design include multiple even designs, the even designs must be isomorphic.

We know that an even design will have all even length words in the defining relation while an even/odd design has $2^{p-1}$ odd-length words and $2^{p-1}-1$ even-length words. If an even/odd design projects to an even design, then all the odd length words have been removed. Note that the projected even design may be written as a $2^{(k-1)-(p-1)}$; so half of the words in the defining relation have been removed. Therefore all the odd length words must contain the deleted column. Any other even projection must be isomorphic.

Table 2.1 includes the generators, degrees of freedom (for main effects and two-factor interactions), word length pattern (wlp) and the alias length pattern (alp) for each of the 32-run even/odd designs. For example, design 9-4.1 has $a_1 = 8$ clear two-factor interactions, $a_2 = 12$ pairs of aliased two-factor interactions, $a_4 = 1$ set of four aliased two-factor interactions, and 9 + 21 = 30 degrees of freedom for main effects and two-factor interactions.

The catalog of designs in Appendix B shows all 148 even/odd $2_{IV}^{k-p}$ designs of size 64. Here we use our own notation to identify the designs since CSW (1993) did not list all the $n = 64$ designs in their catalog and their ordering did not accord with any obvious criteria. We rank the alternative $2_{IV}^{k-p}$ designs for a given $k$ using the following criterion:

1. Smaller $w_4$
2. For designs with the same $w_4$, smaller $w_5$
3. For designs with the same ($w_4$, $w_5$), larger $a_1$

To avoid confusion with the CSW numbering, we use the letters a, b, … rather than numerals to index the designs. Table B.1 does include a column identifying the CSW number for those designs that are included in their 1993 catalog.

We make the following observations regarding the catalog in Appendix B. First, there are only eight even/odd second order saturated resolution IV designs of size 64:

- 20-14.a
- 18-12.c
- 17-11.b,d,e,g,j
- 13-7.b

Second, a non-sos design in Appendix B may be the projection of more than one sos design. For instance, 16-10.b is the projection of either sos design 17-11.b or 17-11.d.

Note that each $n = 8, 16, 32, \ldots$ there is only one even resolution IV second-order saturated (sos) design, the minimal design with $k = n/2$. Thus, the following results are apparent:

- For $n = 8$ and 16, there exists only the unique even sos design with $k = n/2$.
- For $n = 32$, there exist three sos designs, with $k = 9$, 10, and 16.
- For $n = 64$, there exist nine sos designs, with $k = 13$, 17, 18, 20, and 32.

The sos designs with the smallest $k$ are of particular interest because these designs provide the most degrees of freedom for two-factor interactions. We examine the 9-4.2 and 13-7.b designs now. Design 9-4.2 has $w_4 = 7$, and these length-four words involve only seven of the nine factors. Thus, all the interactions involving two factors are clear. This design is structured as $\frac{1}{2}\left[2_{IV}^{7-3} \times 2^2\right]$, where the one-half fraction of the product array is obtained by dividing each smaller design into two blocks and then taking only two of the four block combinations (see Figure 2.2 ) where the $2_{IV}^{7-3}$ has generators 6 = 123, 7 = 124, 8 = 134. Note that the product array above is fractionated using I = +23459.

Design 13-7.b has similar structure: $\frac{1}{4}\left[2_{IV}^{7-3} \times 2_{IV}^{6-2}\right]$, with each 16-run sub-design divided into four blocks (see Figure 2.3). Butler (2002a) describes these types of designs as joint designs; see also Miller (1997).

| | | $2^2$ | |
|---|---|---|---|
| | | I = -59 (2 runs) | I = 59 (2 runs) |
| $2_{IV}^{7-3}$ with | I = -234 (8 runs) | 8x2=16 runs | |
| | I = 234 (8 runs) | | 8x2=16 runs |

**Figure 2.2: Design Structure for 9-4.2**

| | | $2_{IV}^{6-2}$ with 11 = 5610 and 13 = 5612 | | | |
|---|---|---|---|---|---|
| | | 611 = + 61013 = + | 611 = + 61013 = – | 611 = – 61013 = + | 611 = – 61013 = – |
| $2_{IV}^{7-3}$ with 7=123, 8=124, 9=134 | 1 = + 234 = + | 4×4 = 16 runs | | | |
| | 1 = + 234 = – | | 4×4 = 16 runs | | |
| | 1 = – 234 = + | | | 4×4 = 16 runs | |
| | 1 = – 234 = – | | | | 4×4 = 16 runs |

**Figure 2.3: Design Structure for 13-7.b**

## 3. Projection Design Search Method

The difficulty of finding minimum aberration designs (and other good designs) increases dramatically as the size of the designs grows. As $n$ becomes larger, it is no longer feasible to conduct exhaustive searches. One option is to intelligently reduce the number of designs that must be investigated. The value of sos designs is they represent a small fraction of all possible resolution IV designs and project to all the remaining possible resolution IV designs. Thus from these designs one can project to minimum aberration and other good designs. If all the sos designs for a given $n$ can be found and identified, then we have the starting points for all resolution IV even or even/odd designs for a given $n$.

Our first attempt to find minimum aberration and other good designs was to find all the sos designs for a given run size $n$ and then project from those designs to identify the best designs. To accomplish this requires the ability to find sos designs, distinguish non-isomorphic sos designs, and then to determine the best projections.

The first issue is feasible at $n = 128$. It appears to be possible to find the sos designs at $n = 128$. Projections of these sos designs lead to weak minimum aberration designs and careful evaluation of all sos designs would determine minimum aberration for any $k \leq 64$ at $n = 128$. There are 88 unique sos designs at $n = 128$. However to find the minimum aberration design, one must evaluate all possible sequence of projections; this combinatorial problem currently becomes computationally infeasible beyond ten or more projections. Therefore the projection search method is limited in its usefulness for conducting an exhaustive search; in addition, the number of sos designs explodes at higher $n$. For instance, there are at least 34,015 (and possibly twice that many) sos

designs at $n = 256$ (see section 13). Thus we found it necessary to pursue alternative methods.

## 4. Detecting Isomorphic Designs

To successfully find minimum aberration designs requires a computationally fast and efficient method to find and compare designs, as well as some ability to quickly identify isomorphic designs.

When searching for designs, most of the time is spent evaluating isomorphic designs. CSW (1993) were not able to distinguish all $n = 128$ designs beyond $k = 11$ because of the time required to find a complete relabeling of columns for every isomorphic design check. At $n = 128$ with $k = 11$ factors, there are 2,597 sets of four generators that produce a resolution IV designs. Of these designs, there are only 92 non-isomorphic designs. This is the last step CSW completed (Sun 2001). Consider at $k = 17$ we have found 14,438 unique resolution IV designs, and a total of 302,384 sets of ten generators producing a resolution IV design. Thus, on average, there are more than 20 ways to construct each unique design and the number of designs to compare is two orders of magnitude greater.

Two fractional factorial designs are isomorphic ($D_1 \cong D_2$) if one design can be obtained from the other design by relabeling the factors, reordering the runs, or switching the levels of factors (Chen and Lin 1991). Clark and Dean (2001) present a necessary and sufficient condition for two designs to be isomorphic based on a geometrical representation of the designs. Let $D$ represent an $n \times k$ design matrix with $n$ runs, $k$ factors, and levels $\pm 1$. Let $T(D) = DD'$, which is related to the Hamming distance matrix $H$, since $T = kJ_k - 2H$ where $J_k$ is a $k \times k$ matrix of unit elements. Note that for any design $D$, the $(i, j)^{\text{th}}$ element of $T$, denoted as $T_{ij}(D)$, is equal to the inner product of

the $i^{th}$ and $j^{th}$ rows of D. Clearly $T_{ij}(D) = k$ for $i = j$. Other properties of $T$ are discussed in sections five and six. We now describe a result from Clark and Dean (2001) and introduce more notation:

Clark and Dean's Corollary 2.2: Designs $D_1$ and $D_2$ are isomorphic if and only if there exists an $n \times n$ permutation matrix $R$ and a permutation $\{c_1, c_2, \ldots, c_k\}$ of $\{1, 2, \ldots, k\}$ such that, for $q = 1, 2, \ldots, k$: $T(D_1^{\{1,2,\cdots,q\}}) = RT(D_2^{\{c_1, c_2, \cdots, c_q\}})R'$ where $D^{\{1,2,\ldots,q\}}$ denotes a $q$-factor subset of the full design including just the listed columns.

We will say that $T(D_1)$ is equivalent to $T(D_2)$ [denoted as $T(D_1) \equiv T(D_2)$] if for some permutation matrix $R$, $T(D_1) = RT(D_2)R'$. Define $D_i^{\{q\}}$ to represent the design with only the $q^{th}$ column from $D_i$. Similarly, $D_i^{\{\bar{q}\}}$ is the design matrix with all the columns of $D_i$ except for column $q$. Observe that $T_{ij}(D^{\{\bar{q}\}}) = (k-1)$ for $i = j$. Based on Clark and Dean's Corollary, we have Lemma 4.1:

Lemma 4.1: $D_1 \cong D_2$ if and only if $T(D_1) \equiv T(D_2)$ and $D_1^{\{\bar{q}\}} \cong D_2^{\{\bar{c}_q\}}$ for some integers $q$ and $c_q$.

Note that by Clark and Dean's Corollary 2.2 $D_1^{\{\bar{k}\}} \cong D_2^{\{\bar{c}_k\}}$ if and only if there exists $R$ and $\{c_1, \cdots, c_{k-1}\}$ such that

$T(D_1^{\{\bar{k}\}}) = RT(D_2^{\{\bar{c}_k\}})R'$, $T(D_1^{\{\bar{k},\overline{k-1}\}}) = RT(D_2^{\{\bar{c}_k, \bar{c}_{k-1}\}})R', \cdots, T(D_1^{\{1\}}) = RT(D_2^{\{c_1\}})R'$. Then $D_1 \cong D_2$, if and only if $T(D_1) \equiv T(D_2)$ and $D_1^{\{\bar{q}\}} \cong D_2^{\{\bar{c}_q\}}$ for some integers $q$ and $c_q$.

Lemma 4.2: $\{T(D^{\{\bar{1}\}}), \cdots, T(D^{\{\bar{k}\}})\}$ determines $T(D)$.

We show this result for an arbitrary element $T_{ij}(D)$. Suppose we have a design $D$, with $k$ factors and we know the $T$ matrices for the $k$ projections $\{T(D^{\{\bar{1}\}}), \cdots, T(D^{\{\bar{k}\}})\}$

for $D$. Define $r = \frac{T_{ij}(D)+k}{2}$. Then for $r$ values of $l = 1,2,\cdots,k$, $T_{ij}(D^{\{\bar{l}\}}) = T_{ij}(D) - 1$, and for $k - r$ values of $l$, $T_{ij}(D^{\{\bar{l}\}}) = T_{ij}(D) + 1$. There are two possibilities for $T_{ij}(D)$: The set $\{T_{ij}(D^{\{\bar{1}\}}),\cdots,T_{ij}(D^{\{\bar{k}\}})\}$ will contain both $T_{ij}(D) - 1$ and $T_{ij}(D) + 1$ values, in which case they bound $T_{ij}(D)$; or the set will contain one constant value, in which case $T_{ij}(D) = T_{ij}(D^{\{\bar{l}\}}) + 1$ if $T_{ij}(D^{\{\bar{l}\}})$ is positive, or $T_{ij}(D^{\{\bar{l}\}}) - 1$ if $T_{ij}(D^{\{\bar{l}\}})$ is negative.

Q.E.D.

Lemma 4.2 states that the set of $\{T(D^{\{\bar{1}\}}),\cdots,T(D^{\{\bar{k}\}})\}$ determines $T(D)$. If we are missing one of the projections from that set, we can still determine $T(D)$.

Corollary 4.1: $k - 1$ members from $\{T(D^{\{\bar{1}\}}),\cdots,T(D^{\{\bar{k}\}})\}$ determine $T(D)$.

The proof is as follows: Suppose we have design $D_i$, with $k$ factors and we know $k - 1$ of the members from $\{T(D^{\{\bar{1}\}}),\cdots,T(D^{\{\bar{k}\}})\}$. $T_{ij}(D^{\{\bar{q}\}})$ will either increase or decrease the value of $T_{ij}(D)$ by one. Recall that $r = \frac{T_{ij}(D)+k}{2}$ and for $r$ values of $l = 1,2,\cdots,k$, $T_{ij}(D^{\{\bar{l}\}}) = T_{ij}(D) - 1$, and for $k - r$ values of $l$, $T_{ij}(D^{\{\bar{l}\}}) = T_{ij}(D) + 1$. If we are missing one projection, we can still determine $T_{ij}(D)$. There are two possibilities for $T_{ij}(D)$: The set will contain both $T_{ij}(D) - 1$ and $T_{ij}(D) + 1$ values, in which case they bound $T_{ij}(D)$; or the set will contain one constant value, in which case $T_{ij}(D) = T_{ij}(D^{\{\bar{l}\}}) + 1$ if $T_{ij}(D^{\{\bar{l}\}})$ is positive, or $T_{ij}(D^{\{\bar{l}\}}) - 1$ if $T_{ij}(D^{\{\bar{l}\}})$ is negative.

Now we make two conjectures regarding isomorphism of two designs based on isomorphism of their delete-one-factor projections. Let $D_1$ and $D_2$ be any regular $2^{k-p}$ designs with no repeat rows (runs).

Conjecture 4.1: If $D_1^{\{\bar{i}\}} \cong D_2^{\{\bar{c}_i\}}$ with $i = 1,2,\cdots,k$, where $\{c_1, c_2, \cdots, c_k\}$ is any permutation of the integers $\{1,2,\cdots,k\}$, then $D_1 \cong D_2$.

We know under the following conditions that the conjecture is true: Note that $T(D_1^{\{\bar{1}\}}) + \cdots + T(D_1^{\{\bar{k}\}}) = (k-1)T(D_1)$ and $T(D_2^{\{\bar{1}\}}) + \cdots + T(D_2^{\{\bar{k}\}}) = (k-1)T(D_2)$. Without loss of generality, assume the columns of $D_2$ are ordered such that $D_1^{\{\bar{i}\}} \cong D_2^{\{\bar{i}\}}\ \forall i$. Then there exists an $R_i \ni T(D_1^{\{\bar{i}\}}) = R_i T(D_2^{\{\bar{i}\}}) R_i'$. If $R_1 = \cdots = R_k = R$ then $T(D_1^{\{\bar{i}\}}) = RT(D_2^{\{\bar{i}\}})R' \forall i$ and $\sum T(D_1^{\{\bar{i}\}}) = \sum RT(D_2^{\{\bar{i}\}})R'$. Then $(k-1)T(D_1) = (k-1)T(D_2)$. Thus $T(D_1) = T(D_2)$ and $\therefore D_1 \cong D_2$.

The key requirement of the conjecture is that $\{D_1^{\{\bar{i}\}}\} \cong \{D_2^{\{\bar{i}\}}\}$ for $i = 1,\cdots,k$ implies $T(D_1) \equiv T(D_2)$. We know this requirement is not true in general. In fact, we know that a non-simple design may share the same set of projections as a simple design, but will have a different $T$ matrix. For example consider the $2^4$ full factorial design and the replicated $2_{IV}^{4-1}$ fractional factorial design. While they share the same projections, they have different $T$ matrices.

Define $S \subset \{1,2,\cdots,k\}$ with cardinality $s$. If Conjecture 4.1 is true, then we suppose that the following stronger conjecture may also be true.

Conjecture 4.2 If two designs $D_1$ and $D_2$, have $s$ projections in common, and these $s$ projections of $D_1$, $\{D_1^{\{\bar{i}\}} : i \in S\}$ determine $T(D_1)$, then $D_1 \cong D_2$.

Assume we have two designs, $D_1$ and $D_2$, with $s$ projections in common, $D_1^{\{\bar{i}\}} \cong D_2^{\{\bar{c}_i\}}$ for $i \in S$. If the $s$ projections of $D_1$, $\{D_1^{\{\bar{i}\}} : i \in S\}$ determine $T(D_1)$, then they also determine $T(D_2)$ and we suppose $D_1 \cong D_2$.

## 5. Advantages and Uses of the *T* Matrix

Hedayat, Sloane, and Stufken's definition 3.4 (1999) states that an orthogonal array OA($N$, $k$, 2, $t$) with levels from GF(2) is said to be linear if it is simple (runs are distinct) and if, when considered as $k$-tuples from GF(2), its N runs form a vector space over GF(2) (i.e., satisfy the condition that if $R_1$ and $R_2$ are any two runs of the array then every $k$-tuple $c_1R_1 + c_2R_2$ is also a run, for any choice of $c_1, c_2 \in GF(2)$).

It is known that all two-level regular fractional factorial designs are OA($N$, $k$, 2, $t$) with $t$ = (resolution – 1). All regular fractional factorial designs without repeat runs are simple. Fractional factorial designs with a defining relation (regular design) are a subclass of orthogonal arrays and are linear codes (Hedayat, Sloane, and Stufken p.276). Therefore we can take the sum of any two rows from a regular fractional factorial design and using modulus(2) arithmetic it will equal another row in the design. Note that the element-wise product for two runs with levels $\pm 1$ is equivalent to modulus(2) arithmetic for the same two runs with levels 0 and 1. Hence, for regular two level fractional factorial design with levels of $\pm 1$, any two rows multiplied element-wise will result in another row of the design.

For example consider a $2^{5-2}_{III}$ regular fractional factorial design where:

$$D = \begin{matrix} -1 & -1 & -1 & -1 & 1 \\ -1 & -1 & 1 & 1 & -1 \\ -1 & 1 & -1 & 1 & 1 \\ -1 & 1 & 1 & -1 & -1 \\ 1 & -1 & -1 & 1 & -1 \\ 1 & -1 & 1 & -1 & 1 \\ 1 & 1 & -1 & -1 & -1 \\ 1 & 1 & 1 & 1 & 1 \end{matrix}$$

and the $T$ matrix is:

$$T(D) = DD' = \begin{bmatrix} 5 & -1 & 1 & -1 & -1 & 1 & -1 & -3 \\ -1 & 5 & -1 & 1 & 1 & -1 & -3 & -1 \\ 1 & -1 & 5 & -1 & -1 & -3 & -1 & 1 \\ -1 & 1 & -1 & 5 & -3 & -1 & 1 & -1 \\ -1 & 1 & -1 & -3 & 5 & -1 & 1 & -1 \\ 1 & -1 & -3 & -1 & -1 & 5 & -1 & 1 \\ -1 & -3 & -1 & 1 & 1 & -1 & 5 & -1 \\ -3 & -1 & 1 & -1 & -1 & 1 & -1 & 5 \end{bmatrix}.$$

Note that each column (and row) of $T$ have the same distribution of values. For instance, each column contains the values -3, -1, 1, and 5 with frequencies 1, 4, 2, and 1, respectively.

Theorem 5.1: Any two-level regular factorial design $D$ will have a constant column distribution in $T(D)$.

We now show that the elements of $t_i^D$ are a permutation of the elements of $t_j^D$ for arbitrary $i$ and $j$ from {1, …, n}. We know that $x_i x_j = x_l$ for some $l \in \{1,2,...,n\}$, where $x_i x_j$ is defined as the element-wise product of the $i^{\text{th}}$ and $j^{\text{th}}$ rows. Hence, $x_i x_l = x_j$.

Now define $t_j^D = D \cdot x_j$ where $x_j'$ is the $j^{\text{th}}$ row of $D$, and rewrite $t_j^D = \begin{bmatrix} x_1' x_j \\ \vdots \\ x_n' x_j \end{bmatrix}$ using the specified $i^{\text{th}}$ and $j^{\text{th}}$ rows above as $t_j^D = \begin{bmatrix} x_1'(x_i x_l) \\ \vdots \\ x_n'(x_i x_l) \end{bmatrix} = \begin{bmatrix} (x_1 x_l)' x_i \\ \vdots \\ (x_n x_l)' x_i \end{bmatrix}$. From the definition of a group we know that any element from a group multiplied by the group results in the

original group. Therefore this implies that the matrix $= \begin{bmatrix} (x_1 x_l)' x_i \\ \vdots \\ (x_n x_l)' x_i \end{bmatrix}$ contains all the

elements of $t_i^D$. Q.E.D.

## 6. Functions of the *T* Matrix

We know from Theorem 5.1 that $t_1^D, \cdots, t_n^D$ are simply different permutations of the same vector. Butler (2003) states that $T_{ij}(D)$ measures the confounding between the $i^{th}$ and $j^{th}$ rows. He defines $\mu_k = n^{-2}\sum_{i=1}^{n}\sum_{j=1}^{n} T_{ij}^k(D)$ as the $k^{th}$ moment of the elements of the $T$ matrix. Therefore, the moments $\mu_0, \cdots, \mu_k$ provide an overall measure of the confounding between rows of the design (Butler 2003). By Theorem 5.1 we can use any one column of the $T$ matrix to calculate the moments of a regular design. When our use of $t_i^D$ does not depend on the subscript $i$, we simply write $t^D$ to represent an arbitrary column of $T$. We know from Butler (2003) that the design moments for $D$ can be used to compare and rank designs. The design moments method results in an identical ranking of designs that results from using the word length pattern for designs (Butler 2003). Since the word length pattern and moments of $T$ are both functions of $t^D$, it is possible that $t^D$ might be more discriminating than the moments of a design or equivalently the word length pattern. However; by Theorem 6.1, the frequencies of $t^D$ can be written as a function of the moments, so $t^D$ is no more discriminating than is the word length pattern.

Let $f_0, \ldots, f_k$ represent the frequency of values for $-k, (-k+2), \ldots, k$, respectively, in $t^D$.

Theorem 6.1: The frequencies $f_0, \ldots, f_k$ are a function of the moments $\mu_0, \cdots, \mu_k$.

We can write $n\mu_j = \sum_{i=0}^{k} (2i-k)^j f_i$ for $j \in \{0,1,\cdots,k\}$

Note that: $n\mu_0 = \sum_{i=0}^{k}(2i-k)^0 f_i = \sum_{i=o}^{k} f_i = n$. Define $\mu_j' = \sum_{i=0}^{k} i^j f_i / n$ and let

$M = \begin{bmatrix} \mu_0 \\ \vdots \\ \mu_k \end{bmatrix}$ and $M^* = \begin{bmatrix} \mu_0' \\ \vdots \\ \mu_k' \end{bmatrix}$. Note that $M = BM^*$ where $B$ is a lower triangular matrix

with positive values on the diagonal since $\mu_r = E[2i-k]^r = 2^r E[i^r] - 2^{r-1} rkE[i^{r-1}] + \ldots$

$= 2^r \mu_r' - 2^{r-1} rk\mu_{r-1} + \ldots$. We know that the determinant of a triangular matrix is equal to the product of the elements along the diagonal (Eves, p123). Hence, $M^* = B^{-1}M$ since the matrix $B$ is nonsingular and can be inverted.

Now write the moments of a design, $\mu_0', \cdots, \mu_k'$, as a system of equations

$nM^* = AF$ where $F = \begin{bmatrix} f_0 \\ \vdots \\ f_k \end{bmatrix}_{(k+1)\times 1}$ and the coefficient matrix $A$ is:

$$A = \begin{bmatrix} 1 & 1 & 1 & 1 \ldots & 1 \\ 0 & 1 & 2 & 3 \ldots & k \\ 0 & 1 & 2^2 & 3^2 \ldots & k^2 \\ \vdots & \vdots & \vdots & \vdots \cdots & \vdots \\ 0 & 1 & 2^k & 3^k \ldots & k^k \end{bmatrix}_{(k+1)\times(k+1)}$$

The determinant of matrix $A$ can be described as a Vandermonde determinant (Eves p.127). From this literature, it is known that $A$ is nonsingular (since the values of $A$ are integer and increasing [0, 1, …,k]). Thus $A$ can be inverted, so we can rewrite our system of equations in terms of $F = A^{-1}nM^*$ and $F = nA^{-1}B^{-1}M$. This means the frequencies, $F$, are a function of the moments $M$. Therefore the probabilities that generate those

moments are unique and the moments are unique in the sense that any two designs with the same moments $M$ must have identical $t^D$ frequencies $F$.

Since word length pattern, or equivalently $t^D$, is unsuccessful in distinguishing many designs at $n = 64$ and larger, we are interested in creating a more discriminating function from pairs of columns of $T$. Let $T2^D$ represent the set of $n$ pairs of columns of $T$ for $D$ where $T2^D = \{(t_1^D, t_1^D), (t_1^D, t_2^D), \cdots, (t_1^D, t_n^D)\}$.

Define $G(T2^D) = \{g(t_1^D, t_1^D), g(t_1^D, t_2^D), \cdots, g(t_1^D, t_n^D)\}$, where $g(t_1^D, t_v^D) = \sum_{r=1}^{n} h(T_{r1}T_{rv})$ and $h(x) = 0$ when $x \le 0$, and $h(x) = x^{-1}$ when $x > 0$. For example, consider the $2_{III}^{5-2}$ regular design again. The $t^D$ vector contains the values -3, -1, 1, and 5, with frequencies 1, 4, 2, and 1, respectively. Figure 6.1 shows the four bivariate frequency distributions that occur for the pairs of columns for $T$. While the columns of $T$ have identical frequency distributions, the pairs of columns for $T$ do not. For the $n$ pairs $(t_1^D, t_j^D)$ $j = 1, 2, \cdots, n$, four possibilities occur with frequencies 1, 4, 2, and 1, respectively (see Figure 6.1). Therefore, $G(T2^D) = \{6.1511, 0.667, 4.4, 0.667, 0.667, 4.4, 0.667, 6.0\}$ for this design. We sort this set for our convenience in comparing designs so that $G(T2^D) = \{0.667, 0.667, 0.667, 0.667, 4.4, 4.4, 6.0, 6.1511\}$.

We chose to define $T2^D$ above pairing each of the $n$ columns of $T$ with $t_1^D$. We now show that the set $G(T2^D)$ is invariant to the choice of which column we fix.

Lemma 6.1: For any $i \in (1, \cdots, n)$, $\{g(t_i^D, t_j^D)\ j = 1, \cdots, n\} = \{g(t_n^D, t_{r_j}^D)\ j = 1, \cdots, n\}$ where $(r_1, \cdots, r_n)$ is a permutation of $(1, \cdots, n)$.

| $(1,j)$ Pairs of $T$ matrix columns: | Bivariate distribution: | | | | | $g(t_1^D, t_j^D)$ |
|---|---|---|---|---|---|---|
| | | -3 | -1 | 1 | 5 | totals | |
| | -3 | 1 | | | | 1 | |
| (1, 1) | -1 | | 4 | | | 4 | = 6.1511 |
| | 1 | | | 2 | | 2 | |
| | 5 | | | | 1 | 1 | |
| | totals | 1 | 4 | 2 | 1 | 8 | |
| | | -3 | -1 | 1 | 5 | totals | |
| (1, 2) | -3 | | 1 | | | 1 | |
| (1, 4) | -1 | 1 | | 2 | 1 | 4 | = 0.667 |
| (1, 5) | 1 | | 2 | | | 2 | |
| (1, 7) | 5 | | 1 | | | 1 | |
| | totals | 1 | 4 | 2 | 1 | 8 | |
| | | -3 | -1 | 1 | 5 | totals | |
| | -3 | | | 1 | | 1 | |
| (1, 3) | -1 | | 4 | | | 4 | = 4.4 |
| (1, 6) | 1 | 1 | | | 1 | 2 | |
| | 5 | | | 1 | | 1 | |
| | totals | 1 | 4 | 2 | 1 | 8 | |
| | | -3 | -1 | 1 | 5 | totals | |
| | -3 | | | | 1 | 1 | |
| (1, 8) | -1 | | 4 | | | 4 | = 6.0 |
| | 1 | | | 2 | | 2 | |
| | 5 | 1 | | | | 1 | |
| | totals | 1 | 4 | 2 | 1 | 8 | |

**Figure 6.1:** $2_{III}^{5-2}$ ***T* Matrix, Pairs of Columns**

Without loss of generality, assume $x_n$ is the treatment combination with all +1 levels. Then the element-wise product of $x_i x_j = x_n x_{r_j} = x_{r_j}$ for some $r_j \in \{1,\cdots,n\}$. Hence, Lemma 6.1. By this lemma, $\{g(t_i^D, t_j^D)\ j = 1,\cdots,n\}$ is invariant to the choice of $i$. We defined $T2^D$ with $i = 1$.

Theorem 6.2: $D_1 \cong D_2 \Rightarrow G(T2^{D_1}) = G(T2^{D_2})$

Since $D_1 \cong D_2$, there exists $\{r_1,\cdots,r_n\}$ , a permutation of $\{1,\cdots,n\}$, such that $T(D_1) = RT(D_2)R'$ where $R$ is the permutatin matrix defined as $R_{ij} = 1$ if $j = r_i$, and zero otherwise. Then $(t_1^{D_1}, t_j^{D_1}) = (Rt_{r_1}^{D_2}, Rt_{r_j}^{D_2})$ for $j = (1, \ldots, n)$. So $g(t_1^{D_1}, t_j^{D_1}) = g(t_{r_1}^{D_2}, t_{r_j}^{D_2})$ for $j = (1, \ldots, n)$, because the permutation matrix $R$ does not affect the computation of $g(\cdot,\cdot)$ since we are summing the rows. Then by Lemma 6.1, $\{g(t_{r_1}^{D_2}, t_{r_j}^{D_2})\ j = 1,\cdots,n\} = G(T2^{D_2})$ and so $G(T2^{D_1}) = G(T2^{D_2})$. Q.E.D.

The set $G(T2^D)$ uniquely identifies all regular resolution IV designs for $n < 128$. At $n = 128$, $G(T2^D)$ uniquely identifies 296,958 of the 296,960 even/odd designs (it does not uniquely identify 2 even/odd designs) which differ based on their delete-one-factor projections. However, it does distinguish the two $2_{VII}^{31-16}$ regular designs that are commonly cited from Chen and Lin (1991) as an example of non-isomorphic designs with common letter pattern matrices. See Section 11 for more comparisons with other common criterion.

## 7. Exhaustive Even/Odd Design Search Method

We now present a new method for finding minimum aberration designs using a build up and delete-one-factor projection strategy. As noted previously, CSW were unable to fully enumerate designs beyond $k = 11$ at $n = 128$, due to the enormous computations required to perform their isomorphism checks. Our approach for regular factorial designs attempts to take advantage of a simplified isomorphism check. Using Conjecture 4.1 we replace the permutation check for isomorphism from Clark and Dean and check the set of delete-one-factor projections for each design. We save only the unique sets of delete-one-factor projections and the $G(T2^D)$ set, thus determining our non-isomorphic designs.

If Conjecture 4.1 is not true, then there could exist designs with non-equivalent $T$ matrices that have a common set of delete-one-factor projections. We differentiated designs based on their delete-one-factor projections. We did not check $G(T2^D)$ simultaneously with the delete-one-factor projections and therefore did not have the occasion to find any designs with isomorphic delete-one-factor projections but different sets of $G(T2^D)$, which would provide a counter-example to Conjecture 4.1 for $n = 128$.

The approach is as follows: begin with all non-isomorphic resolution IV designs with $k$ factors. Consider all possible $k + 1$ factor designs obtained by adding a generator to each $k$ factor design. We then check the $k + 1$ delete-one-factor projections. If the $k + 1$ delete-one-factor projections for design $D_1$ are equal to the $k + 1$ one-factor projections for $D_2$ then the designs are considered isomorphic by Conjecture 4.1; otherwise they are non-isomorphic. This process can be repeated as we increase $k$ by one factor at a time.

Using this approach allowed us to complete an "exhaustive" search of even/odd designs at $n = 128$ for $k \leq 40$.

Another step to reduce the computational burden at $n = 128$ was the elimination of the requirement to retain even designs past $k = 22$. This was possible for the following reasons. Resolution IV $2^{k-p}$ even/odd designs project to a set of $k-m$ $2^{(k-1)-(p-1)}$ even/odd designs and $m$ isomorphic $2^{(k-1)-(p-1)}$ even designs (by Lemma 2.1), where $m$ is defined as the multiplicity for the number of delete-one-factor projections from a $2^{k-p}$ design that project to a $2^{(k-1)-(p-1)}$ even design.

We classify $m$ into three cases: When $m = 0$, the set of $k$ projections are all $2^{(k-1)-(p-1)}$ even/odd designs and by Lemma 4.2 we can determine $T(D)$. When $m = 1$, we use Conjecture 4.2, motivated by Corollary 4.1 and the set of $k-1$ even/odd $2^{(k-1)-(p-1)}$ designs to determine $D$. The last case, when $m > 1$, is determined as follows: We know $k-m$ projections are $2^{(k-1)-(p-1)}$ even/odd designs and $m$ projections are isomorphic $2^{(k-1)-(p-1)}$ even designs. Without loss of generality, suppose $D^{\{\bar{i}\}}$ $i = 1, \cdots, m$ are $2^{(k-1)-(p-1)}$ even designs, and the remaining $k-m$ projections are $2^{(k-1)-(p-1)}$ even/odd designs. Then $G(T2^{D^{\{\bar{1}\}}})$, $m$, and $D^{\{\bar{i}\}}$ $(i > m)$ determine $D$ (up to isomorphism). The reason is as follows: for n = 8, 16, 32, and 64, we know that $G(T2^{D})$ uniquely distinguishes all $2^{k-p}_{IV}$ designs. For $n = 128$, even $2^{(k-1)-(p-1)}_{IV}$ designs projected from $2^{k-p}_{IV}$ designs with $m \geq 2$, permit us to distinguish $D$ by $G(T2^{D})$ since the even $2^{(k-1)-(p-1)}_{IV}$ designs can be written as the product array $2^{1} \times 2^{(k-2)-(p-1)}$ and so all are uniquely distinguished by $G(T2^{D})$.

## 8. Resolution IV Designs of Size 128

We characterize the even/odd resolution IV design for $n = 128$ using five criterion:

- wlp (minimum aberration)
- Maximum degrees of freedom used for main effects and two-factor interactions
- Minimium $L_{max}$ (the length of the longest two-factor interaction alias chain)
- Maximum number of clear two-factor interactions
- Minimum CD2 (the unique portion of the centered L2 discrepancy from Ma, Fang, and Lin 2001).

The minimum aberration designs for $k \leq 40$ at $n = 128$ are listed in Table 8.1 along with the above criteria and their respective ranking. The complete alp is also provided for each design. Appendix C contains a catalog of the best even/odd designs and their rankings for $k = 8, \ldots, 40$ with respect to our various criteria.

Our exhaustive search of even/odd designs found not only the minimum aberration designs, but also a number of interesting results. All minimum aberration designs from $10 \leq k \leq 40$ are even/odd designs. We found that the uniform centered design criteria (Ma, Fang, and Lin 2001) is closely related to the word length pattern. Our calculation of the minimum CD2* value agreed with the minimum aberration design in all but four cases; in those cases, the minimum aberration value was the second smallest CD2* value.

**Table 8.1: Minimum Aberration Regular Resolution IV (or higher) Designs for $n = 128$**

| Design | wlp | | | | | alp | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2* rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $w_4$ | $w_5$ | $w_6$ | $w_7$ | $w_8$ | | | | | | | | | |
| 8-1.1 | 0 | 0 | 0 | 0 | 1 | 28 | 36 | 28 | 1 | 1 | 1 | 1 | 55.09 | 1 |
| 9-2.1 | 0 | 0 | 3 | | | 36 | 45 | 36 | 1 | 1 | 1 | 1 | 49.59 | 1 |
| 10-3.1 | 0 | 3 | 3 | | | 45 | 55 | 45 | 1 | 1 | 1 | 1 | 44.63 | 1 |
| 11-4.1 | 0 | 6 | 6 | | | 55 | 66 | 55 | 1 | 1 | 1 | 1 | 40.17 | 1 |
| 12-5.1 | 1 | 8 | 12 | | | 60 3 | 75 | 60 | 2 | 1 | 1 | 1 | 36.16 | 1 |
| 13-6.1 | 2 | 16 | 18 | | | 66 6 | 85 | 66 | 2 | 1 | 1 | 1 | 32.55 | 1 |
| 14-7.1 | 3 | 24 | 36 | | | 73 9 | 96 | 73 | 2 | 1 | 1 | 1 | 29.30 | 1 |
| 15-8.1 | 7 | 32 | 52 | | | 63 21 | 99 | 63 | 2 | 2 | 11 | 1 | 26.39 | 1 |
| 16-9.1 | 10 | 48 | 72 | | | 60 30 | 106 | 60 | 2 | 2 | 24 | 1 | 23.77 | 1 |
| 17-10.1 | 15 | 60 | 130 | | | 46 45 | 108 | 46 | 2 | 53 | 1594 | 1 | 21.42 | 1 |
| 18-11.1 | 20 | 80 | 200 | | | 33 60 | 111 | 33 | 2 | 209 | 10601 | 1 | 19.30 | 1 |
| 19-12.1 | 27 | 120 | 235 | | | 36 54 9 | 118 | 36 | 3 | 22 | 5807 | 1 | 17.40 | 1 |
| 20-13.1 | 36 | 152 | 340 | | | 24 60 14 1 | 119 | 24 | 4 | 111 | 28084 | 1 | 15.69 | 1 |
| 21-14.1 | 51 | 200 | 414 | | | 26 54 15 4 3 | 123 | 26 | 5 | 23 | 17819 | 45 | 14.17 | 2 |
| 22-15.1 | 65 | 248 | 572 | | | 25 36 32 8 0 1 | 124 | 25 | 6 | 20 | 14585 | 942 | 12.80 | 1 |
| 23-16.1 | 83 | 316 | 744 | | | 12 52 24 9 2 2 1 | 125 | 12 | 7 | 10 | 32307 | 5495 | 11.57 | 1 |
| 24-17.1 | 102 | 384 | 992 | | | 0 54 16 24 0 4 | 122 | 0 | 6 | 120 | 27865 | 4 | 10.46 | 1 |
| 25-18.1 | 124 | 482 | 1312 | | | 0 64 0 18 20 | 127 | 0 | 5 | 1 | 20240 | 1 | 9.469 | 1 |
| 26-19.1 | 152 | 568 | 1704 | | | 0 29 41 4 16 8 | 124 | 0 | 6 | 13 | 13068 | 1 | 8.579 | 1 |
| 27-20.1 | 180 | 690 | 2200 | | | 0 15 55 0 12 16 | 125 | 0 | 6 | 6 | 7696 | 1 | 7.779 | 1 |
| 28-21.1 | 210 | 840 | 2800 | | | 0 0 70 0 0 28 | 126 | 0 | 6 | 2 | 3930 | 1 | 7.061 | 1 |
| 29-22.1 | 266 | 945 | 3472 | | | 0 0 70 0 0 0 28 | 127 | 0 | 7 | 1 | 1914 | 1 | 6.431 | 1 |
| 30-23.1 | 335 | 972 | 4662 | | | 0 0 0 40 40 0 0 0 0 2 5 | 117 | 0 | 11 | 773 | 799 | 182 | 5.866 | 1 |
| 31-24.1 | 391 | 1134 | 5826 | | | 0 0 0 24 48 8 0 0 0 0 3 4 | 118 | 0 | 12 | 323 | 331 | 96 | 5.352 | 1 |
| 32-25.1 | 452 | 1322 | 7219 | | | 0 0 0 12 48 19 1 0 0 0 0 4 3 | 119 | 0 | 13 | 130 | 125 | 46 | 4.891 | 2 |
| 33-26.1 | 518 | 1543 | 8863 | | | 0 0 0 4 40 33 3 0 0 0 0 0 5 2 | 120 | 0 | 14 | 67 | 67 | 27 | 4.478 | 2 |
| 34-27.1 | 589 | 1800 | 10788 | | | 0 0 0 0 24 50 6 0 0 0 0 0 0 6 1 | 121 | - | 15 | 11 | - | 1 | 4.108 | 2 |
| 35-28.1 | 665 | 2100 | 13020 | | | 0 0 0 0 0 70 10 0 0 0 0 0 0 0 7 | 122 | - | 15 | 3 | - | 1 | 3.776 | 1 |
| 36-29.1 | 756 | 2401 | 15736 | | | 0 0 0 0 0 42 38 0 0 0 0 0 0 0 0 7 | 123 | - | 16 | 2 | - | 1 | 3.481 | 1 |
| 37-30.1 | 854 | 2744 | 18886 | | | 0 0 0 0 0 21 51 8 0 0 0 0 0 0 0 0 7 | 124 | - | 17 | 1 | - | 1 | 3.216 | 1 |
| 38-31.1 | 959 | 3136 | 22512 | | | 0 0 0 0 0 7 49 24 0 0 0 0 0 0 0 0 0 7 | 125 | - | 18 | 1 | - | 1 | 2.979 | 1 |
| 39-32.1 | 1071 | 3584 | 26656 | | | 0 0 0 0 0 0 32 48 0 0 0 0 0 0 0 0 0 0 7 | 126 | - | 19 | 1 | - | 1 | 2.767 | 1 |
| 40-33.1 | 1190 | 4096 | 31360 | | | 0 0 0 0 0 0 0 80 0 0 0 0 0 0 0 0 0 0 0 7 | 127 | - | 20 | 1 | - | 1 | 2.576 | 1 |

wlp – word length pattern
C2FI – clear two-factor interactions
alp – alias length pattern of two-factor interactions
Lmax – length of longest alp chain
df – total degrees of freedom used for main effects and two-factor interactions
CD2* - unique portion of uniformity measure value from Ma, Fang, Lin (2001)

No minimum aberration designs have any clear two-factor interactions beyond $k = 23$, although we found designs with clear two-factor interactions up to $k = 33$. We know from Chen and Hedayat (1998) that designs with clear two-factor interactions exist only if $k \leq n/4 + 1$. In general, as the number of factors increases, the number of good designs (based on word length pattern) with clear two-factor interactions decreases.

There exist 296,960 even/odd non-isomorphic resolution IV (or higher) designs for $n = 128$ (see Table 8.2). There are also 88 resolution IV sos designs, and all but one of the sos designs are even/odd designs. We also now know that sos designs may have the same word length patterns but different alp and may even share the same word length pattern as other non-sos designs. For instance, consider the three designs at $k = 33$, where the two sos designs 33-26.42b and 33-26.42c share identical word length patterns with design 33-26.42a which is not an sos design. All three designs have different alias length patterns.

We also found two notably good sos designs: $k = 29$, and $k = 40$. The design at $k = 40$ is well known and many of its projections lead to other minimum aberration designs. The sos design at $k = 29$ has a remarkably smaller number of length-four words than any other $k = 29$ design and several of the sos design's projections are also minimum aberration designs. In particular, the minimum aberration designs can be found by projecting from sos designs at $k = 29$ or $k = 40$ for $k = 40, 39, \ldots, 26, 24, 16, 13, 11, 10,$ and 9 (see Section 12).

It is interesting to note that for $k \leq 40$, the minimum aberration design word length pattern for each $k$ is indeed unique, which supports the conjecture that the word length pattern is unique for minimum aberration resolution IV designs. In fact, only

**Table 8.2: Existence of Resolution IV$^+$ designs**

| $k$ | # of even/odd designs, $n = 64$ | # of even designs, $n = 64$ | # of even/odd designs, $n = 128$ | # of even designs, $n = 128$ |
|---|---|---|---|---|
| 7 | 2 | 2 | - | - |
| 8 | 3 | 4 | 2 | 3 |
| 9 | 6 | 6 | 7 | 6 |
| 10 | 12 | 12 | 19 | 14 |
| 11 | 20 | 14 | 62 | 30 |
| 12 | 22 | 21 | 180 | 69 |
| 13 | 24 | 23 | 487 | 136 |
| 14 | 20 | 29 | 1,240 | 295 |
| 15 | 15 | 29 | 2,926 | 596 |
| 16 | 11 | 37 | 6,208 | 1,292 |
| 17 | 10 | 30 | 11,787 | 2,651 |
| 18 | 3 | 30 | 19,466 | 5,598 |
| 19 | 1 | 24 | 27,994 | 11,341 |
| 20 | 1 | 23 | 35,192 | 22,728 |
| 21 | - | 16 | 39,201 | 43,516 |
| 22 | - | 15 | 38,847 | 79,603 |
| 23 | - | 9 | 34,868 | ? |
| 24 | - | 8 | 28,133 | ? |
| 25 | - | 5 | 20,569 | ? |
| 26 | - | 4 | 13,498 | ? |
| 27 | - | 2 | 8,075 | ? |
| 28 | - | 2 | 4,284 | ? |
| 29 | - | 1 | 2,149 | ? |
| 30 | - | 1 | 976 | ? |
| 31 | - | 1 | 433 | ? |
| 32 | - | 1 | 197 | ? |
| 33 | - | - | 101 | ? |
| 34 | - | - | 31 | ? |
| 35 | - | - | 13 | ? |
| 36 | - | - | 8 | ? |
| 37 | - | - | 3 | ? |
| 38 | - | - | 2 | ? |
| 39 | - | - | 1 | ? |
| 40 | - | - | 1 | ? |

at $k = 31$, does one have to go beyond length-5 words in the defining relation to differentiate minimum aberration designs from weak minimum aberration designs.

Finally, the $L_{\max}$ results show that it is impossible to create an $n = 384$ ¾-design (John 1962) for $k \geq 20$ from resolution IV fractions, since $L_{\max} > 3$. Also many of the better designs based on word length pattern are also ranked in the best designs according to $L_{\max}$. For example, the top eight designs based upon word length pattern are also the top eight ranked designs for $L_{\max}$ at $k = 18$.

## 9. Incomplete Enumeration of Designs Based on Word Length Pattern

As the size of $n$ increases, more and more computer resources are required to fully enumerate designs. The next two sections explore computationally simpler (imperfect) isomorphism checks in order to evaluate their potential merit for $n = 256$ and beyond.

Butler developed an algorithm using a flawed isomorphic rule based on the moments of the designs (word length pattern) that starts with a basic set of factors and then adds one generator at a time to construct new designs. He describes his approach as follows:

> "The iterative algorithm uses all the designs with distinct wordlength patterns (or equivalently, distinct $T$ moments) for $k$ factors and adds an extra factor to each to form designs for $k + 1$ factors. Only designs with distinct wordlength patterns are retained for the next stage of the algorithm. At each stage, the wordlength pattern is determined from the elements of T. The algorithm does not recognize that on rare occasions designs with the same wordlength pattern are not necessarily isomorphic. However, a design for $k$ factors can be formed from any of the $k$ projections involving $k - 1$ factors and so designs are highly unlikely to be lost altogether." (Butler 2002b)

Using Butler's methodology, we were able to easily search for even/odd resolution IV designs using Matlab version 6.5 on a Pentium III and IV computer.

Our program constructed a full factorial in seven basic factors for $n = 128$ runs and then constructed a generator matrix of all possible generators (based on the 120 different interactions involving the basic columns). We then started with the seven basic factors and added one generator at a time. We calculated $t^D$ for each design and retained only one design for each distinct $t^D$ vector. This method does not distinguish between non-isomorphic designs with identical design moments (word length patterns). In our implementation, this method was successful in finding all minimum aberration designs except at $k = 24$, where we found only the weak minimum aberration design. In general,

we lost about two percent of the word length patterns using this approach at $n = 128$ runs (see Table 10.1). However, we only identified 20% of the even/odd designs that exist. Thus having non-isomorphic designs with the same wlp is a very common occurrence at $n = 128$. For example, the word length pattern (0, 0, 0, 8, 34, 42, ...) at $k = 15$, occurs for four designs (see p. 106). Another word length pattern (0, 0, 0, 21, 0, 80, ...) at $k = 15$, occurs for 48 non-isomorphic designs.

## 10. An Improved Imperfect Isomorphic Rule Approach

In an effort to find a more discriminating function than $t^D$ (or equivalently, wlp) for our imperfect isomorphic rule approach to determining isomorphic designs, we turned to the $G(T2^D)$ vector. $G(T2^D)$ uniquely determined the same designs cataloged by Sun (2001) and CSW (1993) for $n = 128$ and $k = 8, 9, 10, 11$ as well as all designs at $n = 64$. Although we know that several non-isomorphic designs do have identical $G(T2^D)$ sets, this happened in only rare instances (see Table 10.1). This means that only those designs with unique $G(T2^D)$ vectors are kept as we sequentially build up our designs. While this method does miss some designs, the $G(T2^D)$ vector is much more discriminating than $t^D$.

The empirical results at $n = 128$ show that the designs that were lost were not the better designs in terms of word length pattern, and that although a few (57) non-isomorphic designs were missed, other designs with identical word length pattern, alias length pattern, and number of clear two-factor interaction effects were found.

Table 10.1 lists the number of even/odd designs found using several different isomorphic checks for $n = 128$ and $k \leq 40$. We show the number of even/odd designs found using the word length pattern as a simple but flawed isomorphic rule, and the number of even/odd designs found using $G(T2^D)$ as a flawed isomorphic rule. We also show the complete enumeration of all even/odd designs and the number of unique word length patterns that exist among the exhaustive list obtained based on delete-one-factor projections. We also provide percentages of designs found using the different

**Table 10.1: Comparison of Methods for Finding Even/Odd Resolution IV$^+$ Designs**

| $k$ | # of e/o designs by projections | # of unique e/o wlp by projections | $t^D$ # of e/o designs found | % found of e/o unique wlp | % found of total e/o designs | $G(T2^D)$, # of e/o designs found | % found of total e/o designs |
|---|---|---|---|---|---|---|---|
| 8 | 2 | 2 | 2 | 100 | 100 | 2 | 100 |
| 9 | 7 | 7 | 7 | 100 | 100 | 7 | 100 |
| 10 | 19 | 18 | 18 | 100 | 94.7 | 19 | 100 |
| 11 | 62 | 48 | 48 | 100 | 77.4 | 62 | 100 |
| 12 | 180 | 118 | 118 | 100 | 65.6 | 180 | 100 |
| 13 | 487 | 243 | 243 | 100 | 49.9 | 487 | 100 |
| 14 | 1,240 | 448 | 444 | 99.1 | 35.8 | 1,240 | 100 |
| 15 | 2,926 | 777 | 765 | 98.5 | 26.1 | 2,925 | 99.9 |
| 16 | 6,208 | 1,278 | 1,257 | 98.4 | 20.2 | 6,208 | 100 |
| 17 | 11,787 | 1,996 | 1,946 | 97.5 | 16.5 | 11,787 | 100 |
| 18 | 19,466 | 2,890 | 2,825 | 97.8 | 14.5 | 19,466 | 100 |
| 19 | 27,994 | 4,051 | 3,937 | 97.2 | 14.1 | 27,993 | 99.9 |
| 20 | 35,192 | 5,211 | 5,109 | 98 | 14.5 | 35,192 | 100 |
| 21 | 39,201 | 6,237 | 6,086 | 97.6 | 15.5 | 39,201 | 100 |
| 22 | 38,847 | 6,546 | 6,422 | 98.1 | 16.5 | 38,847 | 100 |
| 23 | 34,868 | 6,361 | 6,226 | 97.9 | 17.8 | 34,868 | 100 |
| 24 | 28,133 | 5,656 | 5,578 | 98.6 | 19.8 | 28,133 | 100 |
| 25 | 20,569 | 4,709 | 4,629 | 98.3 | 22.5 | 20,569 | 100 |
| 26 | 13,498 | 3,575 | 3,516 | 98.4 | 26.0 | 13,498 | 100 |
| 27 | 8,075 | 2,611 | 2,547 | 97.5 | 31.5 | 8,075 | 100 |
| 28 | 4,284 | 1,720 | 1,691 | 98.3 | 39.5 | 4,284 | 100 |
| 29 | 2,149 | 1,119 | 1,099 | 98.2 | 51.1 | 2,149 | 100 |
| 30 | 976 | 632 | 620 | 98.1 | 63.5 | 976 | 100 |
| 31 | 433 | 340 | 332 | 97.6 | 76.7 | 433 | 100 |
| 32 | 197 | 177 | 175 | 98.9 | 88.8 | 197 | 100 |
| 33 | 101 | 90 | 90 | 100 | 89.1 | 101 | 100 |
| 34 | 31 | 30 | 30 | 100 | 96.8 | 31 | 100 |
| 35 | 13 | 13 | 13 | 100 | 100 | 13 | 100 |
| 36 | 8 | 8 | 8 | 100 | 100 | 8 | 100 |
| 37 | 3 | 3 | 3 | 100 | 100 | 3 | 100 |
| 38 | 2 | 2 | 2 | 100 | 100 | 2 | 100 |
| 39 | 1 | 1 | 1 | 100 | 100 | 1 | 100 |
| 40 | 1 | 1 | 1 | 100 | 100 | 1 | 100 |

approaches. In no cases did the sets of delete-one-factor projections fail to distinguish designs with different $t^D$ or $G(T2^D)$.

## 11. Interesting Designs of Size 128

While letter pattern and $G(T2^D)$ are more discriminating than wlp, neither is universally more successful. For example, at $k = 11$ we found non-isomorphic designs with distinct $G(T2^D)$ values and identical letter pattern matrices, while at $k = 15$ we found non-isomorphic designs with identical $G(T2^D)$ (and identical bivariate distributions) but distinct letter pattern matrices.

During the exhaustive search for designs, a number of interesting designs were encountered in trying to determine non-isomorphic designs. We describe four problem cases of interest. Below is a sample of some of the designs encountered along with a short description of the designs and their properties.

Problem Case 1:

The first case occurs at $k = 11$. Let pc11a, pc11b, and pc11c represent the three problem designs. All three even/odd designs have the same word length pattern and the same alias length pattern. The first design, pc11a, has a different letter pattern matrix than pc11b and pc11c. The other two designs, pc11b and pc11c, have identical letter pattern matrices. All three designs have unique $G(T2^D)$ values. Table 11.1 lists the generators for these designs.

**Table 11.1: $k = 11$, $n = 128$ Problem Designs**

| Design | Generators |
|---|---|
| pc11a | 7 25 43 116 |
| pc11b | 7 45 56 91 |
| pc11c | 7 56 77 91 |

Problem Case 2:

The second case occurs at $k = 15$. These even/odd designs have identical $G(T2^D)$ values, identical word length patterns, and identical alias length patterns. However, the letter pattern matrix for each design is different. Table 11.2 lists the generators for these designs.

Problem Case 3:

The third case occurs at $k = 16$. There are 18 pairs of designs that have various $G(T2^D)$ values. Each pair of designs also have identical word length patterns and identical letter pattern matrices respectively. The designs do have different alias length patterns. The first four designs listed below are even/odd designs (a1 through b2) and the remaining designs are even. Table 11.3 lists the generators for these designs.

**Table 11.2: $k = 15$, $n = 128$ Problem Designs**

| Design | Generators |
|---|---|
| pc15a | 7 11 19 38 59 73 100 120 |
| pc15b | 7 11 19 38 62 73 97 120 |

**Table 11.3: $k = 16, n = 128$ Problem Designs**

| Design | Generators | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| pc16a1 | 7 | 11 | 19 | 41 | 52 | 61 | 74 | 101 | 120 |
| pc16a2 | 7 | 11 | 19 | 35 | 61 | 62 | 73 | 85 | 120 |
| pc16b1 | 7 | 11 | 21 | 38 | 57 | 73 | 82 | 93 | 120 |
| pc16b2 | 7 | 11 | 19 | 38 | 57 | 73 | 84 | 93 | 120 |
| pc16c1 | 7 | 11 | 21 | 26 | 31 | 112 | 121 | 122 | 124 |
| pc16c2 | 7 | 11 | 21 | 25 | 31 | 112 | 121 | 122 | 124 |
| pc16d1 | 7 | 25 | 42 | 55 | 79 | 112 | 121 | 122 | 124 |
| pc16d2 | 7 | 25 | 31 | 42 | 52 | 112 | 121 | 122 | 124 |
| pc16e1 | 7 | 11 | 21 | 26 | 52 | 84 | 121 | 122 | 124 |
| pc16e2 | 7 | 25 | 26 | 47 | 79 | 112 | 121 | 122 | 124 |
| pc16f1 | 7 | 13 | 21 | 104 | 110 | 112 | 118 | 121 | 122 |
| pc16f2 | 7 | 11 | 13 | 19 | 100 | 103 | 121 | 122 | 124 |
| pc16g1 | 7 | 13 | 28 | 35 | 62 | 104 | 112 | 121 | 122 |
| pc16g2 | 7 | 19 | 28 | 41 | 79 | 112 | 121 | 122 | 124 |
| pc16h1 | 7 | 13 | 28 | 38 | 59 | 104 | 112 | 121 | 122 |
| pc16h2 | 7 | 19 | 31 | 41 | 79 | 112 | 121 | 122 | 124 |
| pc16i1 | 7 | 13 | 38 | 61 | 91 | 104 | 112 | 121 | 122 |
| pc16i2 | 7 | 13 | 22 | 38 | 59 | 104 | 112 | 121 | 122 |
| pc16j1 | 7 | 13 | 44 | 55 | 104 | 110 | 112 | 121 | 122 |
| pc16j2 | 7 | 13 | 38 | 59 | 61 | 104 | 112 | 121 | 122 |
| pc16k1 | 7 | 13 | 44 | 79 | 104 | 110 | 112 | 121 | 122 |
| pc16k2 | 7 | 13 | 38 | 59 | 91 | 104 | 112 | 121 | 122 |
| pc16l1 | 7 | 38 | 61 | 69 | 94 | 104 | 112 | 121 | 122 |
| pc16l2 | 7 | 13 | 22 | 59 | 91 | 104 | 112 | 121 | 122 |
| pc16m1 | 7 | 13 | 22 | 44 | 49 | 62 | 112 | 121 | 122 |
| pc16m2 | 7 | 13 | 44 | 59 | 91 | 104 | 112 | 121 | 122 |
| pc16n1 | 7 | 13 | 22 | 44 | 49 | 82 | 112 | 121 | 122 |
| pc16n2 | 7 | 13 | 44 | 55 | 59 | 104 | 112 | 121 | 122 |
| pc16o1 | 7 | 19 | 28 | 35 | 61 | 76 | 112 | 121 | 122 |
| pc16o2 | 7 | 28 | 38 | 47 | 61 | 104 | 112 | 121 | 122 |
| pc16p1 | 7 | 21 | 25 | 47 | 55 | 84 | 112 | 121 | 122 |
| pc16p2 | 7 | 28 | 38 | 47 | 59 | 104 | 112 | 121 | 122 |
| pc16q1 | 7 | 11 | 19 | 38 | 44 | 52 | 100 | 121 | 122 |
| pc16q2 | 7 | 13 | 21 | 38 | 59 | 104 | 112 | 121 | 122 |
| pc16r1 | 7 | 11 | 19 | 38 | 44 | 100 | 103 | 121 | 122 |
| pc16r2 | 7 | 13 | 21 | 59 | 91 | 104 | 112 | 121 | 122 |

Problem Case 4:

The fourth case occurs at $k = 19$. The following two pairs of designs have identical $G(T2^D)$ values, word length pattern, alias length pattern, and letter pattern matrices respectively. They are only distinguished by their sets of delete-one-factor projections. The first pair (pc19a1 and pc19a2) are even designs, the second pair are even/odd designs. Table 11.4 lists the generators for these designs.

**Table 11.4: $k = 19$, $n = 128$ Problem Designs**

| Design | Generators | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| pc19a1 | 7 | 13 | 22 | 44 | 49 | 62 | 91 | 98 | 112 | 118 | 121 | 122 |
| pc19a2 | 7 | 13 | 22 | 44 | 49 | 62 | 91 | 98 | 112 | 121 | 122 | 124 |
| pc19b1 | 7 | 11 | 25 | 31 | 35 | 50 | 85 | 104 | 112 | 121 | 122 | 124 |
| pc19b2 | 7 | 11 | 25 | 31 | 35 | 50 | 86 | 104 | 112 | 121 | 122 | 124 |

## 12. Finding Good Designs Using Naïve Projections

As noted previously, the difficulty of finding minimum aberration designs (and other good designs) increases as $n$ becomes larger. Examining the case of $n = 64$ suggests that sequentially eliminating factors to minimize the number of length four words in the resulting design (ties broken by the minimization of length-five words, then length-six words, etc.) from a relatively few sos designs present a few design arrays from which good (minimum aberration) designs are found. This method will be referred to as the naïve projection approach.

Table 12.1 lists the number of length-four words ($w_4$) for minimum aberration designs and for the naïve projections from each of the eight even/odd sos designs for $n = 64$. The naïve projections that result in the minimum aberration design are marked with "*", while those projections resulting in a weak minimum aberration design are marked with "**".

**Table 12.1: Number of Length-Four Words for SOS Naïve Projections, $n = 64$**

| $k$ | MA | sos20 | sos18 | sos17b | sos17d | sos17e | sos17g | sos17j | sos13 |
|---|---|---|---|---|---|---|---|---|---|
| 20 | 125 | 125* | | | | | | | |
| 19 | 100 | 100* | | | | | | | |
| 18 | 78 | 78* | 92 | | | | | | |
| 17 | 59 | 59* | 68 | 60 | 65 | 68 | 73 | 105 | |
| 16 | 43 | 43* | 49 | 45 | 45 | 49 | 53 | 77 | |
| 15 | 30 | 30* | 34 | 33 | 33 | 33 | 37 | 55 | |
| 14 | 22 | 22* | 22** | 23 | 23 | 23 | 24 | 38 | |
| 13 | 14 | 15 | 14* | 15 | 15 | 15 | 16 | 25 | 14** |
| 12 | 6 | 9 | 8 | 10 | 10 | 10 | 10 | 15 | 6* |
| 11 | 4 | 5 | 4* | 6 | 6 | 6 | 5 | 9 | 4* |
| 10 | 2 | 2* | 2* | 3 | 3 | 3 | 3 | 5 | 2* |
| 9 | 1 | 1* | 1* | 1* | 1* | 1* | 1* | 2 | 1* |
| 8 | 0,2 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |

* = minimum aberration; ** = weak minimum aberration

It is interesting to note that the 20-factor sos design projects to the minimum aberration design for $k = 14, 15, \ldots, 20$ (and also 8, 9, and 10); the 13-factor sos design is weak minimum aberration at $k = 13$, and its naïve projections are minimum aberration for $k = 8, 9, \ldots, 12$. The weak minimum aberration sos design at $k = 13$ has 36 clear two-factor interactions, 16 more than the minimum aberration design and is arguably preferred over the minimum aberration design due to the more clear two-factor interactions.

Since sequential projection from just two $n = 64$ run designs provide attractive designs for all $k = 8, 9, \ldots, 20$, we list these two sos designs in Table 12.2, arranging the design columns so that one only needs to include the number of generators that correspond to the desired number of factors. For instance, for the minimum aberration 18-factor design, simply omit the last two columns of the 20-factor design. The 20-14.a sos design is recommended for $k = 14, \ldots, 20$ and the 13-7.b design for $k = 8, \ldots, 13$. These designs and their embedded projections are the minimum aberration or most preferred designs available for every $k \in [8,20]$. Figures 12.1 and 12.2 show the aliasing of two-factor interactions for these two sos designs, with generators as specified in Table 12.2. By arranging into columns the interactions in these tables, we conveniently and compactly present the aliasing for each of the embedded designs. These tables enable a practitioner to visualize the additional confusion regarding two-factor interactions that result from adding, e.g., two or three more factors to a 10-factor design.

SOS designs represent a small fraction of all possible resolution IV designs and yet they project to all remaining resolution IV designs. Thus from this subset one can project to all minimum aberration and other good designs. Complete enumeration of

**Table 12.2: Generators for SOS Embedded Projection Designs of Size 64**

| Design | Generators for Factors 7-20 (identified by Yates column number) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20-14.a | 31 | 39 | 43 | 61 | 49 | 54 | 13 | 21 | 14 | 19 | 25 | 28 | 44 | 58 |
| 13-7.b | 31 | 39 | 43 | 61 | 51 | 62 | 28 | | | | | | | |

**Design 13-7.b Generators (Yates column number)**

| 31 | 39 | 43 | 61 | 51 | 62 | 28 |
|---|---|---|---|---|---|---|

**Singularity Details (All interactions not listed are clear for designs with k ≤ 13)**

| ***k*:** | **7** | **8** | **9** | **10** | **11** | **12** | **13** |
|---|---|---|---|---|---|---|---|
| | | 3*8 = | 4*9 = | | 5*11 | | |
| | 6*7 = | | | 2*10 = | | 1*12 | |
| | | 4*8 = | 3*9 = | | | | 11*13 |
| 3*4 = | | | 8*9 = | | | | 5*13 |
| | 2*7 = | | | 6*10 = | | | 1*13 |
| 2*6 = | | | | 7*10 = | | | 12*13 |
| | | 5*8 = | | | 3*11 = | | 9*13 |
| | | | 5*9 = | | 4*11 = | | 8*13 |
| 3*5 = | | | | | 8*11 = | | 4*13 |
| 4*5 = | | | | | 9*11 = | | 3*13 |
| | | | | 1*10 = | | 2*12 = | 6*13 |
| | 1*7 = | | | | | 6*12 = | 2*13 |
| 1*6 = | | | | | | 7*12 = | 10*13 |
| 1*2 = | | | | | | 10*12 = | 7*13 |

**Figure 12.1: Design 13-7.b Generators and Aliasing for Embedded Projections**

**Design 20-14.a Generators (Yates column number)**

| 31 39 43 61 49 54 13 | 21 | 14 | 19 | 25 | 28 | 44 | 58 |
|---|---|---|---|---|---|---|---|
| **Singularity Details *k*:** | **14** | **15** | **16** | **17** | **18** | **19** | **20** |
| 1*5 = 6*11 = 8*12 = | 3*14 = | 7*15 = | 2*16 = | 4*17 = | 13*18 = | 10*19 = | 9*20 |
| 2*7 = 6*10 = 9*12 = 5*13 = | 4*14 = | | 15*16 = | 3*17 = | 1*18 = | 11*19 = | 8*20 |
| 3*4 = 8*9 = 10*11 = 1*13 = | | 2*15 = | 7*16 = | 14*17 = | 5*18 = | 6*19 = | 12*20 |
| 6*8 = 11*12 = | | | | | | 9*19 = | 10*20 |
| 6*9 = 10*12= | | | | | | 8*19 = | 11*20 |
| 8*10 = 9*11 = | | | | | | 12*19 = | 6*20 |
| 1*9 = 8*13 = | | | | | 12*18 = | | 5*20 |
| 5*8 = 1*12 = | | | | | 9*18 = | | 13*20 |
| 5*9 = 12*13 = | | | | | 8*18 = | | 1*20 |
| 3*8 = 4*9 = | 12*14 = | | | | | | 17*20 |
| 4*12 = | 9*14 = | | | 8*17 = | | | 3*20 |
| 3*9 = 4*8 = | | | | 12*17 = | | | 14*20 |
| 7*8 = | | 12*15 = | 9*16 = | | | | 2*20 |
| 7*9 = 2*12 = | | | 8*16 = | | | | 15*20 |
| 2*8 = | | 9*15 = | 12*16 = | | | | 7*20 |
| 2*9 = 7*12 = | | 8*15 = | | | | | 16*20 |
| 9*10 = 8*11 = 6*12 = | | | | | | | 19*20 |
| 1*8 = 5*12 = 9*13 = | | | | | | | 18*20 |
| 3*12 = | 8*14 = | | | 9*17 = | | | 4*20 |
| 3*6 = | 11*14 = | | | 10*17 = | | 4*19 | |
| 3*10 = 4*11 = | | | | 6*17 = | | 14*19 | |
| 4*6 = | 10*14 = | | | 11*17 = | | 3*19 | |
| 4*10 = 3*11 = | 6*14 = | | | | | 17*19 | |
| 7*11 = | | 6*15 = | 10*16 = | | | 2*19 | |
| 1*6 = 5*11 = | | | | | 10*18 = | 13*19 | |
| 1*10 = 11*13= | | | | | 6*18 = | 5*19 | |
| 5*10 = 6*13 = | | | | | 11*18 = | 1*19 | |
| 5*6 = 1*11 = 10*13 = | | | | | | 18*19 | |
| 2*6 = 7*10 = | | | 11*16 = | | | 15*19 | |
| 6*7 = 2*10 = | | 11*15 = | | | | 16*19 | |
| 2*11 = | | 10*15 = | 6*16 = | | | 7*19 | |
| 1*2 = | | 13*15 = | 5*16 = | | 7*18 | | |
| 1*7 = | | 5*15 = | 13*16 = | | 2*18 | | |
| 1*3 = 4*13 = | 5*14 = | | | | 17*18 | | |
| 1*4 = 3*13 = | | | | 5*17 = | 14*18 | | |
| 3*5 = | 1*14 = | | | 13*17 = | 4*18 | | |
| 4*5 = | 13*14 = | | | 1*17 = | 3*18 | | |
| 5*7 = 2*13 = | | 1*15 = | | | 16*18 | | |
| 2*5 = 7*13 = | | | 1*16 = | | 15*18 | | |
| 3*7 = | | 14*15 = | 4*16 = | 2*17 | | | |
| 2*3 = | | 4*15 = | 14*16 = | 7*17 | | | |
| 2*4 = | 7*14 = | 3*15 = | | 16*17 | | | |
| 4*7 = | 2*14 = | | 3*16 = | 15*17 | | | |

**Figure 12.2: Design 20-14.a Generators and Aliasing for Embedded Projections**

these projections is prohibitive for large $n$. However, we have found that naïve projections from sos designs at $n = 64$ and $n = 128$ identify the best resolution IV designs.

It is known from projective geometry that for $n = 16, 32, 64, \ldots$, sos designs exist at $k = n/4 + 1$ (Cheng 2002). Furthermore any sos design D with $k$ factors, and $n$ runs can be doubled by the construction method $\begin{bmatrix} D & D \\ D & -D \end{bmatrix}$ to produce a sos design of size $2k$ factors and $2n$ runs (Cheng 2002). For $k > n/4 + 1$, all sos designs are doubled sos designs. To construct sos designs for $k = n/4 + 1$, see Cheng (2003). Unfortunately, these designs only represent a small fraction of the total sos designs that exist for any given $n$.

Complementing Cheng's theoretical results, we have determined for $n = 128$ that there exist 88 resolution IV sos designs, 50 with $k \geq n/4+1$, and 38 with $k < n/4$. Figure 12.3 summarizes these findings. Naïve projections of these sos designs lead to minimum aberration designs. Table 12.3 lists the length four words resulting from the naïve projections for $k = 24$, 22, and 21 sos designs. Table 12.4 lists the naïve projections for the $k = 25$ sos designs. Table 12.5 lists the naïve projections for $k = 29$, 28, 27, and 26 sos designs. Table 12.6 lists the naïve projections for the top ten sos designs at $k = 33$. Table 12.7 lists the naïve projections for $k = 40$, 36, 34, and 31 sos designs.

We have found 88 sos designs at 14 different values of $k$ at $n = 128$. Four of these sos designs are the minimum aberration design; this occurs at $k = 25$, 29, 40, and 64. It is interesting to note that even some of the less desirable (in terms of wlp) sos designs often project to minimum aberration designs and other good designs. For instance, at $k = 28$, the sos design 28-21.1157 (ranked number 1157 in terms of wlp) naively projects to the

| $n = 8$ | $n = 16$ | $n = 32$ | $n = 64$ | $n = 128$ | $k/n$ |
|---|---|---|---|---|---|
| $k = 4$ | $k = 8$ | $k = 16$ | $k = 32$ | $k = 64$ | 1/2 |
| | $k = 5_{(\text{res. V})}$ | $k = 10$ | $k = 20$ | $k = 40$ | 5/16 |
| | | $k = 9$ | $k = 18$ | $k = 36$ | 9/32 |
| | | | $k = 17_{(5\ \text{types})}$ | $k = 34_{(5\ \text{types})}$ | 17/64 |
| | | | | $k = 33_{(42\ \text{types})}$ | 33/128 |
| | | | | | 65/256 |
| | | | | | ⋮ |
| | | | | $k = 31$ | |
| | | | | $k = 29$ | |
| | | | | $k = 28$ | |
| | | | | $k = 27$ | |
| | | | $k = 13$ | $k = 26$ | 38 designs |
| | | | | $k = 25$ | |
| | | | | $k = 24$ | |
| | | | | $k = 22$ | |
| | | | | $k = 21$ | |

**Note:** All sos designs below the dashed line are even/odd designs.

**Figure 12.3: Existence of SOS Designs**

**Table 12.3: $k = 24$, 22, and 21 SOS Designs Naïve Projections Length-4 Words ($w_4$,...), $n = 128$**

| k | MA | sos24a | sos24b | sos24c | sos24d | sos24e | sos24f | sos22a | sos22b | sos21a | sos21b | sos21c | sos21d | sos21e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 102 | 103 | 104 | 109 | 111 | 115 | 115 | | | | | | | |
| 23 | 83 | 84 | 85 | 88 | 88 | 92 | 92 | | | | | | | |
| 22 | 65 | 68 | 68 | 70 | 68 | 72 | 72 | 69 | 85 | | | | | |
| 21 | 51 | 53 | 54 | 53 | 52 | 58 | 56 | 53 | 66 | 52 | 56 | 64 | 80 | 112 |
| 20 | 36 | 41 | 41 | 41 | 38 | 44 | 42 | 41 | 50 | 40 | 44 | 48 | 60 | 80 |
| 19 | 27 | 30 | 30 | 31 | 28 | 33 | 30 | 30 | 37 | 30 | 34 | 36 | 44 | 58 |
| 18 | 20 | 22 | 22 | 23 | 20** | 23 | 21 | 23 | 27 | 23 | 25 | 27 | 31 | 41 |
| 17 | 15 | 15** | 15** | 16 | 15** | 17 | 15** | 17 | 18 | 17 | 19 | 19 | 21 | 28 |
| 16 | 10 | 11 | 11 | 11 | 11 | 12 | 11 | 12 | 12 | 12 | 13 | 12 | 13 | 18 |
| 15 | 7 | 7** | 7** | 7** | 7* | 8 | 7* | 8 | 8 | 8 | 8 | 8 | 8 | 12 |
| 14 | 3 | 4 | 4 | 4 | 3* | 5 | 3* | 5 | 4 | 5 | 5 | 5 | 4 | 8 |
| 13 | 2 | 2* | 2* | 2* | 2** | 3 | 2** | 3 | 2* | 3 | 2* | 2* | 2* | 5 |
| 12 | 1 | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 3 |
| 11 | 0,6 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 1 |
| 10 | 0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| 9 | 0,0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |

**Table 12.4: $k = 25$ SOS Designs Naïve Projections Length-4 Words ($w_4$,...), $n = 128$**

| k | MA | sos25a | sos25b | sos25c | sos25d | sos25e | sos25f | sos25g | sos25h | sos25i | sos25j | sos25k | sos25l | sos25m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 124 | 124* | 125 | 138 | 142 | 143 | 146 | 146 | 147 | 154 | 155 | 155 | 155 | 163 |
| 24 | 102 | 102** | 105 | 107 | 114 | 111 | 115 | 115 | 115 | 119 | 123 | 119 | 119 | 127 |
| 23 | 83 | 83** | 86 | 83* | 89 | 85 | 89 | 89 | 89 | 93 | 97 | 95 | 93 | 99 |
| 22 | 65 | 66 | 68 | 65** | 70 | 65* | 68 | 72 | 69 | 75 | 76 | 76 | 76 | 78 |
| 21 | 51 | 51** | 54 | 51* | 53 | 52 | 52 | 57 | 54 | 59 | 58 | 60 | 60 | 61 |
| 20 | 36 | 39 | 41 | 40 | 40 | 40 | 40 | 44 | 41 | 44 | 44 | 46 | 47 | 47 |
| 19 | 27 | 30 | 31 | 30 | 28 | 30 | 30 | 33 | 31 | 32 | 32 | 35 | 35 | 35 |
| 18 | 20 | 22 | 22 | 23 | 20** | 22 | 22 | 25 | 23 | 23 | 24 | 25 | 26 | 25 |
| 17 | 15 | 15** | 16 | 17 | 15** | 16 | 16 | 18 | 16 | 16 | 17 | 17 | 18 | 16 |
| 16 | 10 | 11 | 11 | 12 | 11 | 11 | 11 | 12 | 11 | 11 | 11 | 12 | 12 | 11 |
| 15 | 7 | 7** | 7** | 8 | 7* | 7** | 7** | 7** | 7** | 7** | 7** | 7** | 7** | 7** |
| 14 | 3 | 4 | 4 | 5 | 3* | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 13 | 2 | 2* | 2* | 3 | 2** | 2* | 2* | 2* | 2* | 2* | 2* | 2* | 2* | 2* |
| 12 | 1 | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** |
| 11 | 0,6 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| 10 | 0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| 9 | 0,0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |

**Table 12.5: $k = 29, 28, 27,$ and 26 SOS Designs Naïve Projections Length-4 Words ($w_4$,...), $n = 128$**

| $k$ | MA | sos29a | sos29b | sos29c | sos28 | sos27a | sos27b | sos27c | sos27d | sos26a | sos26b |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | 266 | 266* | 306 | 370 | | | | | | | |
| 28 | 210 | 210* | 250 | 308 | 290 | | | | | | |
| 27 | 180 | 180* | 208 | 254 | 237 | 202 | 207 | 210 | 234 | | |
| 26 | 152 | 152* | 173 | 207 | 191 | 168 | 163 | 176 | 190 | 181 | 190 |
| 25 | 124 | 126 | 141 | 167 | 153 | 137 | 133 | 145 | 153 | 143 | 146 |
| 24 | 102 | 102* | 114 | 135 | 121 | 111 | 105 | 117 | 122 | 113 | 114 |
| 23 | 83 | 85 | 90 | 107 | 94 | 88 | 86 | 92 | 96 | 91 | 95 |
| 22 | 65 | 69 | 71 | 83 | 71 | 70 | 68 | 73 | 76 | 70 | 77 |
| 21 | 51 | 56 | 56 | 63 | 52 | 54 | 53 | 57 | 59 | 54 | 62 |
| 20 | 36 | 44 | 43 | 48 | 36* | 42 | 41 | 45 | 44 | 39 | 48 |
| 19 | 27 | 34 | 32 | 35 | 27* | 32 | 30 | 34 | 33 | 30 | 37 |
| 18 | 20 | 25 | 23 | 25 | 20** | 24 | 22 | 24 | 24 | 22 | 27 |
| 17 | 15 | 17 | 15** | 17 | 15** | 17 | 16 | 18 | 17 | 16 | 20 |
| 16 | 10 | 10* | 11 | 11 | 11 | 11 | 11 | 12 | 12 | 11 | 14 |
| 15 | 7 | 7** | 7* | 7** | 7* | 7** | 7** | 8 | 8 | 7** | 9 |
| 14 | 3 | 4 | 3* | 4 | 3* | 4 | 4 | 5 | 5 | 4 | 5 |
| 13 | 2 | 2* | 2** | 2* | 2** | 2* | 2* | 3 | 2* | 2* | 3 |
| 12 | 1 | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1** | 1* |
| 11 | 0,6 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| 10 | 0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| 9 | 0,0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |

**Table 12.6: Top Ten $k = 33$ SOS Designs Naïve Projections Length-4 Words ($w_4$,...), $n = 128$**

| $k$ | MA | sos33a | sos33b | sos33c | sos33d | sos33e | sos33f | sos33g | sos33h | sos33i | sos33j | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | 518 | 592 | 592 | 597 | 600 | 600 | 600 | 605 | 605 | 605 | 605 | |
| 32 | 452 | 517 | 509 | 517 | 525 | 525 | 521 | 525 | 521 | 525 | 521 | Plus |
| 31 | 391 | 447 | 434 | 447 | 453 | 455 | 449 | 457 | 453 | 455 | 445 | 32 |
| 30 | 335 | 386 | 366 | 386 | 392 | 392 | 386 | 395 | 392 | 392 | 376 | more... |
| 29 | 266 | 330 | 308 | 330 | 334 | 334 | 330 | 338 | 334 | 334 | 318 | |
| 28 | 210 | 280 | 256 | 280 | 285 | 285 | 280 | 289 | 285 | 285 | 266 | |
| 27 | 180 | 235 | 210 | 235 | 239 | 240 | 235 | 244 | 239 | 240 | 220 | |
| 26 | 152 | 198 | 174 | 198 | 200 | 200 | 198 | 205 | 200 | 200 | 182 | |
| 25 | 124 | 165 | 142 | 165 | 165 | 165 | 165 | 169 | 165 | 165 | 149 | |
| 24 | 102 | 136 | 113 | 136 | 137 | 137 | 136 | 138 | 137 | 137 | 120 | |
| 23 | 83 | 110 | 91 | 112 | 112 | 112 | 110 | 110 | 112 | 112 | 97 | |
| 22 | 65 | 90 | 71 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 76 | |
| 21 | 51 | 72 | 53 | 71 | 71 | 72 | 72 | 72 | 72 | 71 | 59 | |
| 20 | 36 | 57 | 42 | 56 | 56 | 56 | 57 | 57 | 56 | 56 | 46 | |
| 19 | 27 | 45 | 32 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 34 | |
| 18 | 20 | 34 | 24 | 32 | 32 | 32 | 33 | 33 | 32 | 32 | 25 | |
| 17 | 15 | 25 | 18 | 23 | 23 | 23 | 24 | 24 | 23 | 23 | 18 | |
| 16 | 10 | 17 | 13 | 15 | 15 | 15 | 17 | 17 | 15 | 15 | 12 | |
| 15 | 7 | 11 | 8 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 8 | |
| 14 | 3 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | |
| 13 | 2 | 3 | 2* | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2** | |
| 12 | 1 | 2 | 1** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1** | |
| 11 | 0,6 | 1 | 0* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0* | |
| 10 | 0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | |
| 9 | 0,0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | |

**Table 12.7: $k = 40, 36, 34$, and 31 SOS Designs Naïve Projections Length-4 Words ($w_4$,...), $n = 128$**

| $K$ | MA | sos40 | sos36 | sos34a | sos34b | sos34c | sos34d | sos34e | sos31a | sos31b |
|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 1190 | 1190* | | | | | | | | |
| 39 | 1071 | 1071* | | | | | | | | |
| 38 | 959 | 959* | | | | | | | | |
| 37 | 854 | 854* | | | | | | | | |
| 36 | 756 | 756* | 889 | | | | | | | |
| 35 | 665 | 665* | 776 | | | | | | | |
| 34 | 589 | 589* | 674 | 616 | 656 | 680 | 720 | 976 | | |
| 33 | 518 | 518* | 582 | 540 | 560 | 588 | 624 | 848 | | |
| 32 | 452 | 452* | 499 | 471 | 480 | 503 | 537 | 733 | | |
| 31 | 391 | 391* | 426 | 408 | 417 | 432 | 458 | 630 | 410 | 439 |
| 30 | 335 | 335* | 360 | 350 | 359 | 366 | 391 | 538 | 345 | 371 |
| 29 | 266 | 289 | 302 | 300 | 306 | 312 | 330 | 456 | 287 | 310 |
| 28 | 210 | 248 | 254 | 254 | 261 | 262 | 276 | 384 | 238 | 259 |
| 27 | 180 | 210 | 213 | 214 | 219 | 222 | 231 | 321 | 195 | 213 |
| 26 | 152 | 175 | 177 | 177 | 183 | 185 | 190 | 265 | 161 | 176 |
| 25 | 124 | 145 | 145 | 145 | 150 | 154 | 155 | 217 | 130 | 143 |
| 24 | 102 | 121 | 117 | 116 | 121 | 126 | 126 | 176 | 105 | 117 |
| 23 | 83 | 99 | 94 | 95 | 96 | 101 | 100 | 140 | 86 | 94 |
| 22 | 65 | 79 | 73 | 76 | 78 | 81 | 77 | 109 | 68 | 74 |
| 21 | 51 | 61 | 59 | 59 | 62 | 63 | 61 | 85 | 55 | 56 |
| 20 | 36 | 45 | 47 | 44 | 47 | 50 | 48 | 64 | 43 | 44 |
| 19 | 27 | 36 | 36 | 31 | 36 | 38 | 36 | 46 | 32 | 33 |
| 18 | 20 | 28 | 27 | 20* | 26 | 28 | 26 | 34 | 23 | 24 |
| 17 | 15 | 21 | 20 | 15* | 18 | 20 | 19 | 24 | 16 | 17 |
| 16 | 10 | 15 | 14 | 11 | 11 | 13 | 13 | 16 | 11 | 11 |
| 15 | 7 | 10 | 10 | 7* | 7* | 8 | 9 | 11 | 7** | 7** |
| 14 | 3 | 6 | 6 | 3* | 3* | 5 | 6 | 7 | 4 | 4 |
| 13 | 2 | 4 | 3 | 2** | 2** | 2** | 3 | 4 | 2* | 2* |
| 12 | 1 | 2 | 1** | 1** | 1** | 1** | 1** | 2 | 1* | 1* |
| 11 | 0,6 | 1 | 0* | 0* | 0* | 0* | 0* | 1 | 0* | 0* |
| 10 | 0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |
| 9 | 0,0,3 | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* | 0* |

minimum aberration design for $k = 20$, 19, and 15; and the weak minimum aberration design for $k = 18$ and 17.

## 13. Preliminary Results for Resolution IV Designs of Size 256

While identifying almost 300,000 even/odd designs at $n = 128$ was challenging, this pales with the challenge of exhaustively enumerating all designs for $n = 256$ due to the great number of designs. For example, while only 88 sos designs exist at $n = 128$, we have found over 34,000 sos designs in random searches at $n = 256$ (See Table 13.1).

To aid in finding good designs, we implemented a method that combined some of our more successful strategies for finding good designs at $n = 64$ and $n = 128$. Our search at $n = 256$ used two basic approaches. The first approach consists of a random search for sos designs by starting with a design whose columns formed a full factorial and then randomly adding generators to available columns one at a time until an sos design is discovered (stopping if $k > 65$ since all 50 sos designs in this range are already known). Then from these sos designs, we find good designs from the sos designs by naïve projection. The second approach was to find new designs by sequentially building up a factor at a time using $t^D$ as a flawed isomorphic rule to check for isomorphism and retaining the top 2,000 designs from each sequential search and building up from those 2,000 designs.

**Table 13.1: Number of Regular Resolution IV$^+$ designs**

| $n$ | # of even/odd sos designs | # of even/odd designs | # of even designs | # of even sos designs |
|---|---|---|---|---|
| 16 | 1 | 1 | 4 | 1 |
| 32 | 2 | 5 | 20 | 1 |
| 64 | 8 | 150 | 349 | 1 |
| 128 | 87 | $\geq$296,960 | $> 10^6$ | 1 |
| 256 | > 34,015 | ? | ? | 1 |

For naïve projection from sos designs approach, there are at least three ways to find sos designs:

- Double the sos designs at $n = 128$
- Random addition of eligible columns until an sos design is found
- Find good designs using software for fixed $k$ and then build up to an sos design

For the sequential buildup technique the issue of which subset of designs to retain at each step is critical. For instance, if only the top 1,000 designs are retained at each buildup step for $n = 256$, then all the designs buildup to sos designs with $k \leq 40$. Future work will explore this issue.

From Franklin (1984) we know the minimum aberration values for designs with up to $k = 17$ factors for $n = 256$. We also know that as early as $k = 11$, we will lose some designs using $t^D$ as a flawed isomorphic rule. However, we still find all the known minimum aberration designs. At $k = 17$, we found 33,142 resolution IV designs with different $t^D$. Of those, 32,126 are even/odd designs. The 1,016 even designs will continue to grow in number, approximately doubling at each factor until they reach $k = 64$. Based upon our results as $n = 128$, we would expect the number of even/odd designs to increase for each factor until $k = 44$, and then gradually decline at each factor until $k = 80$. (See Table 13.2).

**Table 13.2: Existence of Regular Resolution IV$^+$ designs**

| $k$ | # of even/odd designs, $n = 64$ | # of even designs, $n = 64$ | # of even/odd designs, $n = 128$ | # of even designs, $n = 128$ | # of e/o designs based on $t^D / G(T2^D)$ $n = 256$ | # even designs based on $t^D / G(T2^D)$, $n = 256$ |
|---|---|---|---|---|---|---|
| 7 | 2 | 2 | - | - | - | - |
| 8 | 3 | 4 | 2 | 3 | - | - |
| 9 | 6 | 6 | 7 | 6 | 3 / 3 | 3 / 3 |
| 10 | 12 | 12 | 19 | 14 | 12 / 12 | 9 / 9 |
| 11 | 20 | 14 | 62 | 30 | 44 / 50 | 17 / 24 |
| 12 | 22 | 21 | 180 | 69 | 153 / 231 | 44 / 80 |
| 13 | 24 | 23 | 487 | 136 | 536 / 1,188 | 89 / 241 |
| 14 | 20 | 29 | 1,240 | 295 | 1,690 / 6,505 | 176 / 839 |
| 15 | 15 | 29 | 2,926 | 596 | 4,668 / 54,269 | 312 / 3,467 |
| 16 | 11 | 37 | 6,208 | 1,292 | 12,598 / ? | 564 / ? |
| 17 | 10 | 30 | 11,787 | 2,651 | 32,126 / ? | 1,016 / ? |
| 18 | 3 | 30 | 19,466 | 5,598 | ? | ? |
| 19 | 1 | 24 | 27,994 | 11,341 | ? | ? |
| 20 | 1 | 23 | 35,192 | 22,728 | ? | ? |
| 21 | - | 16 | 39,201 | 43,516 | ? | ? |
| 22 | - | 15 | 38,847 | 79,603 | ? | ? |
| 23 | - | 9 | 34,868 | ? | ? | ? |
| 24 | - | 8 | 28,133 | ? | ? | ? |
| 25 | - | 5 | 20,569 | ? | ? | ? |
| 26 | - | 4 | 13,498 | ? | ? | ? |
| 27 | - | 2 | 8,075 | ? | ? | ? |
| 28 | - | 2 | 4,284 | ? | ? | ? |
| 29 | - | 1 | 2,149 | ? | ? | ? |
| 30 | - | 1 | 976 | ? | ? | ? |
| 31 | - | 1 | 433 | ? | ? | ? |
| 32 | - | 1 | 197 | ? | ? | ? |
| 33 | - | - | 101 | ? | ? | ? |
| 34 | - | - | 31 | ? | ? | ? |
| 35 | - | - | 13 | ? | ? | ? |
| 36 | - | - | 8 | ? | ? | ? |
| 37 | - | - | 3 | ? | ? | ? |
| 38 | - | - | 2 | ? | ? | ? |
| 39 | - | - | 1 | ? | ? | ? |
| 40 | - | - | 1 | ? | ? | ? |

The sheer number of designs that exist at larger $n$ shows the value of the naïve projection method. We are able to rather efficiently evaluate the naïve projections of sos designs at $n = 256$. Table 13.3 below shows the best designs found (based on wlp) for each respective $k$, and the corresponding alp, number of degrees of freedom used for main effects and two-factor interactions, the number of clear two-factors, and $L_{max}$ for each design. The Yates ordered columns for those designs are listed in Table 13.4.

We have found over 34,015 sos designs at $n = 256$. The sos designs found occur at $k = 33, \ldots, 66, 68, 72, 80$, and 128 at $n = 256$. Future work will involve improving methods of finding good sos designs.

Additional future work will involve looking at ways to refining the naïve projection method to possibly including additional projections. It is no surprise that empirical evidence at $n = 128$ demonstrated at times the second best (or worse) projection for one design, could eventually lead to a better design a few projections later. Consider the even/odd $2_{IV}^{40-33}$ design. The naïve projections based on minimizing $t^D$ lead to a different design at $k' = 16$ than if the criteria looked at only minimizing the length-4 and length-5 words with ties broken arbitrarily. The hope would be to find a method to identify which small set of projections lead to good designs. We would want as small a set of projections as possible that lead to good designs to avoid the combinatorial problem of having to look at all possible combinations of projections.

**Table 13.3: Characterization of Good Designs for $n = 256$**

| $k$ | $w_4$ | $w_5$ | $w_6$ | df | C2FI | $L_{max}$ | alp |
|---|---|---|---|---|---|---|---|
| 9 | 0 | 0 | 0 | 45 | 36 | 1 | 36 |
| 10 | 0 | 0 | 1 | 55 | 45 | 1 | 45 |
| 11 | 0 | 0 | 6 | 66 | 55 | 1 | 55 |
| 12 | 0 | 0 | 12 | 78 | 66 | 1 | 66 |
| 13 | 0 | 3 | 12 | 91 | 78 | 1 | 78 |
| 14 | 0 | 9 | 18 | 105 | 91 | 1 | 91 |
| 15 | 0 | 15 | 30 | 120 | 105 | 1 | 105 |
| 16 | 0 | 24 | 44 | 136 | 120 | 1 | 120 |
| 17 | 0 | 34 | 68 | 153 | 136 | 1 | 136 |
| 18 | 3 | 36 | 114 | 162 | 135 | 2 | 135 9 |
| 19 | 4 | 48 | 168 | 178 | 147 | 2 | 147 12 |
| 20 | 5 | 64 | 240 | 195 | 160 | 2 | 160 15 |
| 21 | 9 | 104 | 268 | 206 | 162 | 3 | 162 21 2 |
| 22 | 14 | 137 | 346 | 218 | 168 | 3 | 168 21 7 |
| 23 | 20 | 172 | 450 | 217 | 136 | 3 | 136 57 1 |
| 24 | 27 | 214 | 582 | 221 | 120 | 3 | 120 75 2 |
| 25 | 34 | 266 | 752 | 227 | 108 | 3 | 108 90 4 |
| 26 | 43 | 325 | 963 | 231 | 94 | 3 | 94 102 9 |
| 27 | 53 | 395 | 1224 | 235 | 80 | 4 | 80 114 13 1 |
| 28 | 64 | 476 | 1550 | 239 | 66 | 4 | 66 126 16 3 |
| 29 | 78 | 579 | 1908 | 246 | 73 | 3 | 73 99 45 |
| 30 | 95 | 686 | 2340 | 245 | 55 | 4 | 55 105 50 5 |
| 31 | 113 | 792 | 2928 | 242 | 21 | 6 | 21 140 41 6 1 2 |
| 32 | 133 | 932 | 3576 | 245 | 19 | 6 | 19 124 57 9 2 2 |
| 33 | 153 | 1095 | 4360 | 248 | 17 | 6 | 17 106 75 13 2 2 |
| 34 | 176 | 1280 | 5272 | 252 | 15 | 6 | 15 97 80 21 2 3 |
| 35 | 200 | 1488 | 6360 | 254 | 9 | 6 | 9 88 88 28 2 4 |

**Table 13.3 (Continued)**

| $k$ | $w_4$ | $w_5$ | $w_6$ | df | C2FI | $L_{max}$ | alp |
|---|---|---|---|---|---|---|---|
| 36 | 225 | 1728 | 7632 | 255 | 0 | 6 | 0 81 96 36 0 6 |
| 37 | 264 | 2004 | 8928 | 252 | 2 | 8 | 2 50 102 56 0 2 2 1 |
| 38 | 297 | 2304 | 10592 | 253 | 1 | 8 | 1 33 104 72 0 2 0 3 |
| 39 | 333 | 2632 | 12512 | 254 | 1 | 8 | 1 21 92 96 0 0 2 3 |
| 40 | 370 | 3008 | 14720 | 255 | 0 | 8 | 0 10 80 120 0 0 0 5 |
| 41 | 482 | 3048 | 17583 | 253 | 10 | 10 | 10 25 59 56 39 9 6 5 2 1 |
| 42 | 545 | 3388 | 20650 | 254 | 10 | 10 | 10 24 56 43 45 16 6 9 2 1 |
| 43 | 619 | 3818 | 23512 | 250 | 0 | 13 | 0 22 30 100 27 0 0 23 3 1 0 0 1 |
| 44 | 685 | 4290 | 27229 | 251 | 0 | 13 | 0 17 21 102 39 0 0 12 14 0 1 0 1 |
| 45 | 760 | 4792 | 31458 | 252 | 0 | 13 | 0 16 12 92 59 0 0 6 14 6 0 1 1 |
| 46 | 838 | 5352 | 36209 | 253 | 0 | 13 | 0 16 0 84 79 0 0 2 12 10 2 0 2 |
| 47 | 926 | 5980 | 41305 | 254 | 0 | 14 | 0 16 0 52 110 1 0 2 6 12 5 1 0 2 |
| 48 | 1019 | 6648 | 47182 | 255 | 0 | 15 | 0 16 0 24 132 7 0 2 0 18 0 6 0 0 2 |
| 49 | 1154 | 7383 | 52815 | 253 | 0 | 15 | 0 0 0 36 119 27 0 5 0 0 0 0 6 8 3 |
| 50 | 1257 | 8200 | 60044 | 254 | 0 | 15 | 0 0 0 16 120 46 0 5 0 0 0 0 0 10 7 |
| 51 | 1365 | 9100 | 68068 | 255 | 0 | 15 | 0 0 0 0 112 70 0 5 0 0 0 0 0 0 17 |
| 52 | 1500 | 9264 | 80976 | 249 | 0 | 24 | 0 0 0 6 102 32 0 0 0 48 0 8 0 0 0 0 0 0 0 0 0 0 1 |
| 53 | 1632 | 10164 | 91572 | 250 | 0 | 25 | 0 0 0 3 81 56 0 0 0 24 24 8 0 0 0 0 0 0 0 0 0 0 0 1 |
| 54 | 1769 | 11152 | 103232 | 251 | 0 | 26 | 0 0 0 1 57 82 0 0 0 8 32 16 0 0 0 0 0 0 0 0 0 0 0 0 1 |
| 55 | 1911 | 12240 | 116000 | 252 | 0 | 27 | 0 0 0 0 30 110 0 0 0 0 24 32 0 0 0 0 0 0 0 0 0 0 0 0 0 1 |
| 56 | 2058 | 13440 | 129920 | 253 | 0 | 28 | 0 0 0 0 0 140 0 0 0 0 0 56 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 |
| 57 | 2282 | 14280 | 146272 | 254 | 0 | 28 | 0 0 0 0 0 140 0 0 0 0 0 0 56 0 0 0 0 0 0 0 0 0 0 0 0 0 1 |
| 58 | 2534 | 15120 | 164304 | 255 | 0 | 29 | 0 0 0 0 0 140 0 0 0 0 0 0 0 56 0 0 0 0 0 0 0 0 0 0 0 0 0 1 |
| 59 | 2870 | 14256 | 197856 | 234 | 0 | 22 | 0 0 0 0 0 0 0 48 112 0 0 0 0 0 0 0 0 0 0 11 4 |
| 60 | 3075 | 15552 | 219840 | 235 | 0 | 22 | 0 0 0 0 0 0 0 0 160 0 0 0 0 0 0 0 0 0 0 0 15 |
| 61 | 3307 | 16848 | 244344 | 236 | 0 | 23 | 0 0 0 0 0 0 0 0 112 48 0 0 0 0 0 0 0 0 0 0 3 12 |

**Table 13.3 (Continued)**

| $k$ | $w_4$ | $w_5$ | $w_6$ | df | C2FI | $L_{max}$ | alp |
|---|---|---|---|---|---|---|---|
| 62 | 3548 | 18252 | 270960 | 237 | 0 | 24 | 0 0 0 0 0 0 0 0 72 79 9 0 0 0 0 0 0 0 0 0 0 0 6 9 |
| 63 | 3798 | 19773 | 299796 | 238 | 0 | 25 | 0 0 0 0 0 0 0 0 40 93 27 0 0 0 0 0 0 0 0 0 0 0 0 9 6 |
| 64 | 4057 | 21420 | 330960 | 239 | 0 | 26 | 0 0 0 0 0 0 0 0 16 90 54 0 0 0 0 0 0 0 0 0 0 0 0 0 12 3 |
| 65 | 4325 | 23203 | 364560 | 240 | 0 | 26 | 0 0 0 0 0 0 0 0 0 70 90 0 0 0 0 0 0 0 0 0 0 0 0 0 15 |
| 66 | 4619 | 24989 | 401898 | 241 | 0 | 27 | 0 0 0 0 0 0 0 0 0 42 94 24 0 0 0 0 0 0 0 0 0 0 0 0 2 13 |
| 67 | 4924 | 26912 | 442160 | 242 | 0 | 28 | 0 0 0 0 0 0 0 0 0 21 87 48 4 0 0 0 0 0 0 0 0 0 0 0 0 4 11 |
| 68 | 5240 | 28982 | 485484 | 243 | 0 | 29 | 0 0 0 0 0 0 0 0 0 7 69 72 12 0 0 0 0 0 0 0 0 0 0 0 0 0 6 9 |
| 69 | 5567 | 31210 | 532008 | 244 | 0 | 30 | 0 0 0 0 0 0 0 0 0 0 40 96 24 $a_{29}$=8 $a_{30}$=7 |
| 70 | 5905 | 33612 | 581862 | 245 | 0 | 31 | 0 0 0 0 0 0 0 0 0 0 0 120 40 $a_{30}$=10 $a_{31}$=5 |
| 71 | 6273 | 36014 | 636851 | 246 | 0 | 32 | 0 0 0 0 0 0 0 0 0 0 0 72 80 8 $a_{31}$=11 $a_{32}$=4 |
| 72 | 6654 | 38586 | 695799 | 247 | 0 | 33 | 0 0 0 0 0 0 0 0 0 0 0 0 36 96 27 1 $a_{32}$=12 $a_{33}$=3 |
| 73 | 7048 | 41343 | 758875 | 248 | 0 | 34 | 0 0 0 0 0 0 0 0 0 0 0 0 12 88 57 3 $a_{33}$=13 $a_{34}$=2 |
| 74 | 7455 | 44296 | 826252 | 249 | 0 | 35 | 0 0 0 0 0 0 0 0 0 0 0 0 0 56 98 6 $a_{34}$=14 $a_{35}$=1 |
| 75 | 7875 | 47460 | 898100 | 250 | 0 | 35 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 150 10 $a_{35}$=15 |
| 76 | 8330 | 50625 | 976808 | 251 | 0 | 36 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 90 70 $a_{36}$=15 |
| 77 | 8800 | 54000 | 1060766 | 252 | 0 | 37 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 45 99 16 $a_{37}$=15 |
| 78 | 9285 | 57600 | 1150184 | 253 | 0 | 38 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 15 97 48 $a_{38}$=15 |
| 79 | 9785 | 61440 | 1245272 | 254 | 0 | 39 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 64 96 $a_{39}$=15 |
| 80 | 10300 | 65536 | 1346240 | 255 | 0 | 40 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 160 $a_{40}$=15 |

**Table 13.4: Generators for Table 13.3 Designs for $n = 256$**

| $k$ | Design columns (Yates standard order) |
|---|---|
| 9 | 1 2 4 8 16 32 64 128 255 |
| 10 | 1 2 4 8 16 32 63 64 128 199 |
| 11 | 1 2 4 8 16 32 64 127 128 143 179 |
| 12 | 1 2 4 8 16 32 64 127 128 143 179 213 |
| 13 | 1 2 4 8 16 32 64 105 127 128 143 179 213 |
| 14 | 1 2 4 8 16 27 32 64 105 127 128 143 179 213 |
| 15 | 1 2 4 8 16 27 32 46 64 105 127 128 143 179 213 |
| 16 | 1 2 4 8 16 32 64 75 85 108 127 128 143 150 179 189 |
| 17 | 1 2 4 8 16 32 64 75 85 108 127 128 143 150 179 189 229 |
| 18 | 1 2 4 8 16 27 32 46 64 92 105 127 128 143 179 182 194 213 |
| 19 | 1 2 4 8 16 27 32 46 64 92 105 127 128 143 179 182 194 213 229 |
| 20 | 1 2 4 8 16 27 32 46 64 92 105 127 128 143 179 182 194 213 229 248 |
| 21 | 1 2 4 8 16 23 27 32 46 64 92 105 127 128 143 173 179 213 217 227 254 |
| 22 | 1 2 4 8 16 27 32 46 64 77 88 105 127 128 143 158 164 179 185 201 213 234 |
| 23 | 1 2 4 7 8 16 27 32 46 64 77 105 127 128 143 158 179 185 201 213 220 228 234 |
| 24 | 1 2 4 7 8 16 27 32 46 64 77 94 105 127 128 143 158 179 185 201 213 220 228 234 |
| 25 | 1 2 4 8 16 27 32 46 64 77 87 105 112 127 128 143 158 166 179 180 185 213 220 232 237 |
| 26 | 1 2 4 8 16 27 32 46 64 77 87 105 112 124 127 128 143 158 166 179 180 185 213 220 232 237 |
| 27 | 1 2 4 8 16 27 32 46 64 77 87 105 112 124 127 128 143 158 166 179 180 185 213 219 220 232 237 |
| 28 | 1 2 4 8 16 27 32 46 64 77 87 105 112 124 127 128 143 158 166 179 180 185 213 219 220 232 237 25 |
| 29 | 1 2 4 8 16 23 27 32 39 46 58 64 77 84 105 124 127 128 143 145 146 179 185 200 213 217 225 228 234 |
| 30 | 1 2 4 8 16 27 32 35 46 64 77 87 88 105 112 127 128 143 158 166 179 180 185 193 210 213 219 220 232 237 |
| 31 | 1 2 4 8 16 32 43 50 62 64 75 78 83 85 88 108 113 118 127 128 138 143 149 150 162 173 179 201 232 239 244 |
| 32 | 1 2 4 8 16 32 43 50 62 64 75 78 83 85 88 108 113 118 127 128 138 140 143 149 150 162 173 179 201 232 239 244 |
| 33 | 1 2 4 8 16 32 43 50 62 64 75 78 83 85 88 108 113 118 127 128 138 140 143 149 150 155 162 173 179 201 232 239 244 |
| 34 | 1 2 4 8 16 23 32 43 50 62 64 75 78 83 85 88 108 113 118 127 128 138 140 143 149 150 162 173 179 185 201 232 239 244 |
| 35 | 1 2 4 8 16 23 32 43 50 62 64 75 78 83 85 88 108 113 118 127 128 138 140 143 149 150 162 173 179 185 201 208 232 239 244 |
| 36 | 1 2 4 8 16 23 32 43 50 62 64 75 78 83 85 88 108 113 118 127 128 138 140 143 149 150 162 173 179 185 201 208 229 232 239 244 |
| 37 | 1 2 4 8 16 27 28 32 35 37 46 55 64 70 77 87 105 106 112 124 127 128 137 143 158 166 179 180 185 202 213 219 220 231 232 237 25 |
| 38 | 1 2 4 8 16 27 28 32 35 37 46 55 64 70 77 87 88 105 106 112 124 127 128 137 143 158 166 179 180 185 202 213 219 220 231 232 237 250 |
| 39 | 1 2 4 8 16 27 28 32 35 37 46 55 64 70 77 87 88 105 106 112 124 127 128 137 143 158 166 179 180 185 193 202 213 219 220 231 232 237 250 |

**Table 13.4 (Continued)**

| $k$ | Design columns (Yates standard order) |
|---|---|
| 40 | 1 2 4 8 16 27 28 32 35 37 46 55 64 70 77 87 88 105 106 112 124 127 128 137 143 158 166 179 180 185 193 202 210 213 219 220 231 232 237 250 |
| 41 | 1 2 4 8 14 16 32 39 42 50 53 57 62 64 67 70 74 76 81 84 87 91 93 128 138 151 157 166 171 177 188 196 199 203 210 216 226 233 239 243 244 |
| 42 | 1 2 4 8 14 16 32 39 42 50 53 57 62 64 67 70 74 76 81 84 87 91 93 128 138 151 157 166 171 177 188 196 199 203 210 216 223 226 233 239 243 244 |
| 43 | 1 2 4 8 11 16 19 22 32 35 38 49 61 62 64 71 90 93 106 109 114 117 120 127 128 131 141 153 154 159 170 175 181 182 187 193 198 200 207 212 227 250 253 |
| 44 | 1 2 4 8 11 16 19 22 32 35 38 49 61 62 64 71 90 93 106 109 114 117 120 127 128 131 141 153 154 159 169 170 175 181 182 187 193 198 200 207 212 227 250 253 |
| 45 | 1 2 4 8 11 16 19 22 32 35 38 49 61 62 64 71 90 93 106 109 114 117 120 127 128 131 141 153 154 159 169 170 175 181 182 187 193 198 200 207 211 212 227 250 253 |
| 46 | 1 2 4 8 11 16 19 22 32 35 38 49 61 62 64 71 90 93 106 109 114 117 120 127 128 131 141 153 154 159 169 170 175 181 182 187 193 198 200 207 211 212 227 228 250 253 |
| 47 | 1 2 4 8 11 16 19 22 32 35 38 49 52 61 62 64 71 90 93 106 109 114 117 120 127 128 131 141 153 154 159 169 170 175 181 182 187 193 198 200 207 211 212 227 228 250 253 |
| 48 | 1 2 4 8 11 16 19 22 32 35 38 49 52 61 62 64 71 90 93 106 109 114 117 120 127 128 131 141 153 154 159 169 170 175 181 182 184 187 193 198 200 207 211 212 227 228 250 253 |
| 49 | 1 2 4 7 8 13 14 16 21 26 31 32 42 49 50 52 55 56 59 62 64 75 83 88 101 110 118 125 128 133 143 147 150 156 163 166 169 172 176 181 191 193 202 210 217 228 239 247 252 |
| 50 | 1 2 4 7 8 13 14 16 21 26 31 32 42 49 50 52 55 56 59 62 64 75 83 88 101 110 118 125 128 133 143 147 150 156 163 166 169 172 176 181 186 191 193 202 210 217 228 239 247 252 |
| 51 | 1 2 4 7 8 13 14 16 21 26 31 32 42 47 49 50 52 55 56 59 62 64 75 83 88 101 110 118 125 128 133 143 147 150 156 163 166 169 172 176 181 186 191 193 202 210 217 228 239 247 252 |
| 52 | 1 2 4 8 16 21 30 32 37 43 51 54 57 58 60 64 75 78 86 90 92 95 98 103 104 109 117 123 126 128 131 133 137 142 146 159 167 170 173 177 193 198 204 208 215 219 221 222 224 239 243 244 |
| 53 | 1 2 4 8 16 21 30 32 37 43 51 54 57 58 60 64 75 78 86 90 92 95 98 100 103 104 109 117 123 126 128 131 133 137 142 146 159 167 170 173 177 193 198 204 208 215 219 221 222 224 239 243 244 |
| 54 | 1 2 4 8 16 21 30 32 37 43 51 54 57 58 60 64 75 78 86 90 92 95 98 100 103 104 109 117 123 126 128 131 133 137 142 146 159 167 170 173 177 190 193 198 204 208 215 219 221 222 224 239 243 244 |
| 55 | 1 2 4 8 16 21 30 32 37 43 51 54 57 58 60 64 75 78 86 90 92 95 98 100 103 104 109 117 123 126 128 131 133 137 142 146 152 159 167 170 173 177 190 193 198 204 208 215 219 221 222 224 239 243 244 |
| 56 | 1 2 4 8 16 21 30 32 37 43 51 54 57 58 60 64 75 78 86 90 92 95 98 100 103 104 109 117 123 126 128 131 133 137 142 146 152 159 167 170 173 177 190 193 198 204 208 215 219 221 222 224 239 243 244 249 |
| 57 | 1 2 4 8 16 21 30 32 37 43 51 54 57 58 60 64 75 78 86 90 92 95 98 100 103 104 109 117 123 126 128 131 133 137 142 146 152 159 167 170 173 177 187 190 193 198 204 208 215 219 221 222 224 239 243 244 249 |

**Table 13.4 (Continued)**

| $k$ | Design columns (Yates standard order) |
|---|---|
| 58 | 1 2 4 8 16 21 30 32 37 43 51 54 57 58 60 64 75 78 86 90 92 95 98 100 103 104 109 117 123 126 128 131 133 137 142 146 152 159 167 170 173 177 187 190 193 198 204 208 215 219 221 222 224 229 239 243 244 249 |
| 59 | 1 2 4 8 13 14 16 23 27 32 38 42 44 51 52 56 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 145 150 154 157 161 164 167 168 173 178 185 193 198 205 208 213 220 223 226 233 238 251 |
| 60 | 1 2 4 8 13 14 16 23 27 32 38 42 44 51 52 56 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 145 150 154 157 161 164 167 168 173 178 185 193 198 205 208 213 220 223 226 233 238 251 253 |
| 61 | 1 2 4 8 13 14 16 23 27 32 38 42 44 51 52 56 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 145 150 154 157 161 164 167 168 173 178 185 193 198 205 208 213 217 220 223 226 233 238 251 253 |
| 62 | 1 2 4 8 13 14 16 23 27 32 38 42 44 51 52 56 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 143 145 150 154 157 161 164 167 168 173 178 185 193 198 205 208 213 217 220 223 226 233 238 251 253 |
| 63 | 1 2 4 8 13 14 16 23 27 32 38 42 44 51 52 56 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 143 145 150 154 157 161 164 167 168 173 178 185 193 198 202 205 208 213 217 220 223 226 233 238 251 253 |
| 64 | 1 2 4 8 13 14 16 23 27 32 38 42 44 51 52 56 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 143 145 150 154 157 161 164 167 168 173 178 181 185 193 198 202 205 208 213 217 220 223 226 233 238 251 253 |
| 65 | 1 2 4 8 13 14 16 23 27 32 38 41 42 44 51 52 56 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 143 145 150 154 157 161 164 167 168 173 178 181 185 193 198 202 205 208 213 217 220 223 226 233 238 251 253 |
| 66 | 1 2 4 8 13 14 16 23 27 32 38 41 42 44 51 52 56 63 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 143 145 150 154 157 161 164 167 168 173 178 181 185 193 198 202 205 208 213 217 220 223 226 233 238 251 253 |
| 67 | 1 2 4 8 13 14 16 23 27 32 37 38 41 42 44 51 52 56 63 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 143 145 150 154 157 161 164 167 168 173 178 181 185 193 198 202 205 208 213 217 220 223 226 233 238 251 253 |
| 68 | 1 2 4 8 13 14 16 23 27 32 37 38 41 42 44 51 52 56 63 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 128 131 133 137 140 143 145 150 154 157 161 164 167 168 173 178 181 185 193 198 202 205 208 211 213 217 220 223 226 233 238 251 253 |
| 69 | 1 2 4 8 13 14 16 23 27 32 37 38 41 42 44 51 52 56 63 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 124 128 131 133 137 140 143 145 150 154 157 161 164 167 168 173 178 181 185 193 198 202 205 208 211 213 217 220 223 226 233 238 251 253 |
| 70 | 1 2 4 8 13 14 16 23 27 28 32 37 38 41 42 44 51 52 56 63 64 71 81 82 88 93 94 99 100 104 111 112 117 118 121 122 124 128 131 133 137 140 143 145 150 154 157 161 164 167 168 173 178 181 185 193 198 202 205 208 211 213 217 220 223 226 233 238 251 253 |
| 71 | 1 2 4 8 16 23 25 26 28 32 39 43 45 46 51 53 54 56 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 217 226 228 233 238 241 |
| 72 | 1 2 4 8 16 23 25 26 28 32 39 43 45 46 51 53 54 56 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 213 217 226 228 233 238 241 |

**Table 13.4 (Continued)**

| $k$ | Design columns (Yates standard order) |
|---|---|
| 73 | 1 2 4 8 16 23 25 26 28 32 39 43 45 46 51 53 54 56 63 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 213 217 226 228 233 238 241 |
| 74 | 1 2 4 8 16 23 25 26 28 32 39 43 45 46 51 53 54 56 63 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 213 217 222 226 228 233 238 241 |
| 75 | 1 2 4 8 16 23 25 26 28 32 39 43 45 46 51 53 54 56 63 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 213 217 222 226 228 231 233 238 241 |
| 76 | 1 2 4 8 15 16 23 25 26 28 32 39 43 45 46 51 53 54 56 63 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 213 217 222 226 228 231 233 238 241 |
| 77 | 1 2 4 8 15 16 23 25 26 28 32 39 43 45 46 51 53 54 56 63 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 213 217 222 226 228 231 233 238 241 246 |
| 78 | 1 2 4 8 15 16 23 25 26 28 32 39 43 45 46 51 53 54 56 63 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 213 217 222 226 228 231 233 238 241 246 250 |
| 79 | 1 2 4 8 15 16 23 25 26 28 32 39 43 45 46 51 53 54 56 63 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 213 217 222 226 228 231 233 238 241 246 250 252 |
| 80 | 1 2 4 8 15 16 23 25 26 28 32 39 43 45 46 51 53 54 56 63 64 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 128 131 133 137 142 145 150 152 155 157 161 166 170 172 175 178 180 183 185 190 193 198 200 203 205 208 211 213 217 222 226 228 231 233 238 241 246 250 252 255 |

## 14. Conclusions

This dissertation has introduced the alp which provides another useful characterization of designs. The alp of a design contains the number of clear two-factor interactions, the number of degrees of freedom used for main effects and two-factor interactions, and lists the length of the largest set of aliased two-factor interactions. The alp can be used to calculate the number of length-four words, and is helpful in differentiating designs.

We have also studied projections of designs. We now know that all regular resolution IV designs have at least one sos parent. We know an examination of projections from all the sos designs will result in a complete set of regular resolution IV designs. We have introduced a method to find good designs using naïve projections from sos designs instead of an exhaustive search.

We have examined some of the properties of the $T$ matrix and demonstrated its usefulness in searching for good designs. We have found the minimum aberration designs for $n = 128$ based upon our isomorphic conjecture. We list not only these designs and their properties, but provide a catalog of designs with respect to word length pattern, degrees of freedom used, clear two-factor interactions, and minimizing the length of the longest set of aliased two-factor interactions.

We know that the naïve projections from sos designs leads to all the minimum aberration values for $n = 32$, 64, and 128. We know that the number of regular resolution IV designs increases at a rate that makes exhaustive searches infeasible beyond $n = 128$ using current technology. We know that projections from the doubled sos design at $k = (5/16)n$ results in excellent (and very often minimum aberration) designs. We

provide a number of interesting designs at $n = 128$ that are alike in several (sometimes all) characterization criteria, yet non-isomorphic.

Finally, we have found over 34,015 sos designs for $n = 256$. We show how the magnitude of the number of designs increases with larger $n$. We use naïve projections and build up using the best 2,000 designs to provide a preliminary table of the best designs at $n = 256$.

# References

Box, G. E. P., and Hunter, J. S. (1961), "The $2^{k-p}$ Fractional Factorial Designs." *Technometrics*, 3, 311-351, 449-458.

Butler, N. A. (2003), "Some theory for constructing minimum aberration fractional factorial designs." *Biometrika*, 90, 233-238.

Butler, N. A. (2002a), "Classification of Efficient Two-Level Fractional Factorial Designs." Submitted.

Butler, N. A. (2002b), Private communication. October 2002.

Chen, H., and Hedayat, A. S. (1998), "$2^{n-m}$ designs with resolution III or IV containing clear two-factor interactions." *Journal of Statistical Planning and Inference*, 75, 147-158.

Chen, J. and Lin, D. K. J. (1991), "On the identity relationships of $2^{k-p}$ designs." *Journal of Statistical Planning and Inference*, 28, 95-98.

Chen, J., Sun, D.X., and Wu, C.F.J. (1993). "A Catalogue of Two-level and Three-level Fractional Factorial Designs with Small Runs," *International Statistical Review*, 61, 131-145.

Cheng, C. S. (2003), Presentation, Spring Research Conference, Dayton, Ohio.

Cheng, C. S. (2002), Private communication. Design and Analysis of Experiments I Conference, Vancouver, Canada.

Clark, J. B. and Dean, A. M. (2001),"Equivalence of Fractional Factorial Designs." *Statistica Sinica*, 11, 537-547.

Draper, N. R., and Mitchell, T. J. (1970), "Construction of a set of 512-Run Designs of Resolution $\geq$ 5 and a Set of Even 1024-Run Designs of Resolution $\geq$ 6." *Annals of Mathematical Statistics*, 41, 876-887.

Draper N. R., and Mitchell, T. J. (1968), "Construction of a set of 256-Run Designs of Resolution ≥ 5 and a Set of Even 512-Run Designs of Resolution ≥ 6 with Special Reference to the Unique Saturated Designs." *Annals of Mathematical Statistics*, 39, 246-255.

Draper N. R., and Mitchell, T. J. (1967), "The Construction of Saturated $2_R^{k-p}$ Designs." *Annals of Mathematical Statistics*, 38, 1110-1126.

Eves, H. (1966). *Elementary Matrix Theory*. Allyn and Bacon, Boston.

Franklin, M. F. (1984). "Constructing Tables of Minimum Aberration $p^{n-m}$ Designs." *Technometrics*, 26, 225-232.

Fries, A., and Hunter, W.G. (1980), "Minimum Aberration $2^{k-p}$ Designs." *Technometrics*, 22, 601- 608.

Hedayat, A.S., Sloane, N. J. A., and Stufken, J. (1999), *Orthogonal Arrays: theory and applications*. Springer Publishers, New York.

John, P. W. M. (1962), "Three-quarter replicates of $2^n$ designs" *Biometrics*, 18, 172-184.

Li, H. and Mee, R.W. (2002), "Better Foldover Fractions for Resolution III $2^{k-p}$ Designs," *Technometrics*, 44, 278-283.

Ma, C. X., Fang, K. T., and Lin, D. K. J. (2001), "On the Isomorphism of Fractional Factorial Designs." *Journal of Complexity*, 17, 86-97.

Miller, A. (1997), "Strip-Plot Configurations of Fractional Factorials", *Technometrics*, 39, 153-161.

Montgomery, D.C. (2001). *Design and Analysis of Experiments*, 5th ed., Wiley, NY.

SAS (1999), *SAS/QC User's Guide*, Release 8, Cary, NC: SAS Institute, Inc.

Sun, D. X. (2001), Private communication. Catalog of $n = 64, 128$ two-level designs.

Sun, D. X., Li, W., and Ye, K. Q. (2002), "An Algorithm for Sequentially Constructing Non-Isomorphic Orthogonal Designs and its Applications." Preprint, SUNY-AMS-02-13, 1-27.

Wu, C. F. J., and Hamada, M. (2000), *Experiments, Planning, Analysis, and Parameter Design Optimization*. Wiley & Sons, New York.

# Appendices

## Appendix A: Yates Column Order Design Matrix

**Yates Column Order Generator Matrix, For r > 129,...,255** $i_r = i_{128} + i_{r-128}$

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

**Yates Column Order Generator Matrix (Continued), For r > 129,...,255** $i_r = i_{128} + i_{r-128}$

| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| | | | | | | | 1 |

## Appendix B: Catalog of Even/Odd Resolution IV Design for $n = 64$

**Even-Odd Resolution IV Designs of Size 64**

| Design | csw # | Generators | d.f. | $w_4$, $w_5$, $w_6$, ... | Alias Length Pattern | E/O Proj. |
|---|---|---|---|---|---|---|
| 20-14.a | 1 | 7,11,13,14,19,21,22,35,37,38,57,58,60,63 | 63 | 125, 256, 480,... | 0,0,0,40,0,0,0,0,0,3 | a |
| 19-13.a | 1 | 7 11 13 14 19 21 22 35 37 38 57 58 60 | 62 | 100, 192, ... | 0,0,16,24,0,0,0,0,3 | a, b |
| 18-12.a | 1 | 7 11 13 14 19 21 22 35 37 57 58 60 | 61 | 78, 144, ... | 0,3,25,12,0,0,0,3 | a, c |
| 18-12.b | 2 | 7 11 13 14 19 21 22 35 37 38 57 58 | 61 | 84, 128, ... | 0,16,0,24,0,0,0,2,1 | c, h |
| 18-12.c | 3 | 7 11 13 14 19 21 22 25 26 35 60 63 | 63 | 92, 112, ... | 0,30,0,0,0,14,0,0,1 | f, i |
| 17-11.a | 1 | 7 11 13 14 19 21 35 37 57 58 60 | 60 | 59, 108, ... | 0, 9, 27, 4, 0, 0, 3 | a, c |
| 17-11.b | 2 | 7 11 19 29 37 41 47 49 55 59 62 | 63 | 60, 80, ... | 16, 0, 0, 30 | b |
| 17-11.c | * | 7 11 13 14 19 21 22 35 37 57 58 | 60 | 64, 96, ... | 2, 14, 12, 12, 0, 0, 2, 1 | c, f, g, i |
| 17-11.d | 3 | 7 11 13 19 21 25 35 37 41 49 63 | 63 | 65, 75, ... | 16, 0, 15, 0, 15 | b, d |
| 17-11.e | 4 | 7 11 13 14 19 21 25 35 37 41 63 | 63 | 68, 72, ... | 16, 6, 0, 18, 0, 6 | d, h |
| 17-11.f | * | 7 11 13 14 19 21 22 25 35 60 63 | 62 | 68, 88, ... | 4, 26, 0, 0, 12, 2, 0, 1 | e, g, j |
| 17-11.g | 5 | 7 11 13 14 19 21 22 25 35 37 63 | 63 | 73, 67, ... | 19, 0, 12, 0, 12, 0, 3 | h, i, j |
| 17-11.h | 7 | 7 11 13 14 19 21 22 35 37 38 57 | 60 | 76, 64, ... | 16, 0, 0, 24, 0, 0, 0, 3 | i, |
| 17-11.i | 10 | 7 11 13 14 19 21 22 25 26 35 60 | 62 | 84, 56, ... | 16, 14, 0, 0, 0, 14, 0, 1 | j, k |
| 17-11.j | 6 | 7 11 13 14 19 21 22 25 26 28 63 | 63 | 105, 35, ... | 31, 0, 0, 0, 0, 0, 15 | k |
| 16-10.a | 1 | 7 11 13 19 21 35 37 57 58 60 | 59 | 43, 81, ... | 0, 18, 22, 0, 0, 3 | a, b, d |
| 16-10.b | 2 | 7 11 19 29 37 41 47 49 55 59 | 61 | 45, 60, ... | 15, 0, 15, 15 | c |

| Design | csw # | Generators | d.f. | $w_4, w_5, w_6, \ldots$ | Alias Length Pattern | E/O Proj. |
|---|---|---|---|---|---|---|
| 16-10.c | 7 | 7 11 13 14 19 21 35 37 57 58 | 59 | 47, 72, … | 4, 15, 17, 4, 0, 2, 1 | d, h, j, l |
| 16-10.d | 3 | 7 11 13 19 21 25 35 37 41 63 | 61 | 49, 56, … | 15, 6, 9, 9, 6 | c, f, i |
| 16-10.e | 8 | 7 11 13 14 19 21 25 35 60 63 | 61 | 49, 68, … | 8, 22, 0, 9, 5, 0, 1 | e, g, j, m |
| 16-10.f | 9 | 7 11 13 14 19 21 22 35 57 60 | 59 | 51, 64, … | 4, 24, 0, 12, 0, 1, 2 | h, n |
| 16-10.g | * | 7 11 13 14 19 21 22 35 57 58 | 57 | 52, 64, … | 0, 26, 0, 12, 0, 2, 0, 1 | j, n |
| 16-10.h | 4 | 7 11 13 14 19 21 25 35 37 63 | 61 | 53, 52, … | 18, 3, 9, 9, 3, 3 | i, k, l, m |
| 16-10.i | 10 | 7 11 13 14 19 21 22 35 37 57 | 58 | 57, 48, … | 15, 0, 12, 12, 0, 0, 3 | l, n |
| 16-10.j | 5 | 7 11 13 14 19 21 22 25 35 60 | 60 | 61, 44, … | 17, 12, 0, 0, 12, 2, 1 | m, n, o |
| 16-10.k | 6 | 7 11 13 14 19 21 22 25 26 60 | 60 | 77, 28, … | 29, 0, 0, 0, 0, 14, 1 | o |
| 15-9.a | 1 | 7 11 19 30 37 41 49 60 63 | 58 | 30, 60, … | 0, 30, 10, 0, 3 | a |
| 15-9.b | 2 | 7 11 19 29 30 37 41 49 60 | 58 | 30, 61, … | 0, 30, 10, 0, 3 | a, c |
| 15-9.c | 3 | 7 11 19 29 37 41 47 49 55 | 59 | 33, 44, … | 14, 6, 17, 7 | d, g |
| 15-9.d | 6 | 7 11 13 19 21 35 37 57 58 | 58 | 33, 54, … | 6, 19, 15, 0, 2, 1 | a, c, h, j, n |
| 15-9.e | 7 | 7 11 13 19 21 25 35 60 63 | 60 | 34, 52, … | 12, 18, 5, 9, 0, 1 | b, e, f, j, o |
| 15-9.f | 8 | 7 11 13 19 21 35 41 49 63 | 59 | 35, 42, … | 14, 11, 8, 10, 1 | d, i, k |
| 15-9.g | * | 7 11 13 14 19 21 41 54 63 | 60 | 35, 50, … | 12, 18, 8, 3, 3, 1 | e, m, q |
| 15-9.h | * | 7 11 13 14 19 21 35 57 60 | 58 | 36, 48, … | 8, 20, 8, 4, 1, 2 | h, l, m, r |
| 15-9.i | 9 | 7 11 13 19 21 25 35 37 63 | 59 | 37, 40, … | 17, 6, 11, 7, 3 | g, i, k, n, o |

| Design | csw # | Generators | d.f. | $w_4, w_5, w_6, \ldots$ | Alias Length Pattern | E/O Proj. |
|---|---|---|---|---|---|---|
| 15-9.j | * | 7 11 13 14 19 21 35 57 58 | 56 | 37, 48, ... | 4, 22, 8, 4, 2, 0, 1 | j, m, p, r |
| 15-9.k | 4 | 7 11 13 14 19 21 35 41 63 | 59 | 39, 38, ... | 19, 2, 16, 2, 4, 1 | k, q, r |
| 15-9.l | * | 7 11 13 14 19 21 35 37 57 | 56 | 41, 36, ... | 14, 3, 17, 4, 0, 3 | n, r |
| 15-9.m | 10 | 7 11 13 14 19 21 25 35 60 | 58 | 43, 34, ... | 18, 10, 0, 9, 5, 1 | o, q, r, s |
| 15-9.n | * | 7 11 13 14 19 21 22 35 57 | 56 | 45, 32, ... | 14, 12, 0, 12, 0, 2, 1 | r, t |
| 15-9.o | 5 | 7 11 13 14 19 21 22 25 58 | 57 | 55, 22, ... | 27, 0, 0, 0, 12, 3 | s, t |
| 14-8.a | 1 | 7 11 19 30 37 41 49 60 | 57 | 22, 40, 36, ... | 8, 26, 6, 2, 1 | d, h, o |
| 14-8.b | 2 | 7 11 19 29 30 37 41 47 | 59 | 22, 40, 41, ... | 16, 14, 14, 0, 1 | a, i, m |
| 14-8.c | 6 | 7 11 19 29 30 37 41 49 | 57 | 22, 41, ... | 8, 26, 6, 2, 1 | d, i, l, o |
| 14-8.d | 7 | 7 11 19 30 37 41 52 56 | 57 | 23, 32, ... | 13, 15, 12, 3 | c, f |
| 14-8.e | 8 | 7 11 13 19 21 41 54 63 | 59 | 23, 38, ... | 16, 17, 8, 3, 1 | a, e, h, k, p |
| 14-8.f | 9 | 7 11 13 19 21 46 54 56 | 59 | 23, 40, ... | 16, 17, 8, 3, 1 | e, i, q |
| 14-8.g | 10 | 7 11 19 29 37 41 47 49 | 57 | 24, 31, ... | 16, 9, 15, 3 | f, m, o |
| 14-8.h | * | 7 11 13 19 21 35 57 60 | 57 | 24, 36, ... | 12, 19, 9, 1, 2 | d, g, k, s |
| 14-8.i | * | 7 11 13 19 21 41 49 63 | 57 | 25, 30, ... | 16, 12, 9, 6 | f, j, l, p, q |
| 14-8.j | * | 7 11 13 19 21 35 57 58 | 55 | 25, 36, ... | 8, 21, 9, 2, 0, 1 | h, i, k, r, s |
| 14-8.k | * | 7 11 13 19 21 35 41 63 | 57 | 26, 29, ... | 18, 8, 12, 4, 1 | f, j, p, s |
| 14-8.l | * | 7 11 13 14 19 37 57 63 | 57 | 26, 32, ... | 12, 24, 0, 4, 3 | g, t |

| Design | csw # | Generators | d.f. | $w_4$, $w_5$, $w_6$, … | Alias Length Pattern | E/O Proj. |
|---|---|---|---|---|---|---|
| 14-8.m | * | 7 11 13 14 19 35 53 57 | 55 | 27, 32, … | 8, 26, 0, 5, 1, 1 | k, t, u |
| 14-8.n | * | 7 11 13 19 21 35 37 57 | 54 | 28, 27, … | 13, 9, 15, 0, 3 | l, s |
| 14-8.o | 3 | 7 11 13 19 21 25 35 60 | 56 | 29, 26, … | 19, 8, 5, 9, 1 | m, p, q, s, v |
| 14-8.p | * | 7 11 13 14 19 35 53 54 | 51 | 29, 32, … | 0, 30, 0, 6, 0, 0, 1 | r, u |
| 14-8.q | * | 7 11 13 14 19 21 41 54 | 56 | 30, 25, … | 19, 8, 8, 3, 4 | p, t, w, x |
| 14-8.r | * | 7 11 13 14 19 21 35 57 | 54 | 31, 24, … | 15, 10, 8, 4, 2, 1 | s, t, u, w |
| 14-8.s | 4 | 7 11 13 14 19 21 25 54 | 54 | 38, 17, … | 25, 0, 0, 9, 6 | v, w, x |
| 14-8.t | 5 | 7 11 13 14 19 21 22 57 | 54 | 39, 16, … | 25, 0, 0, 12, 0, 3 | w |
| 13-7.a | 1 | 7 11 21 25 38 58 60 | 58 | 14, 28, … | 20, 18, 6, 1 | b, e, g, i |
| 13-7.b | 2 | 7 11 13 30 46 49 63 | 63 | 14, 33, … | 36, 0, 14 | a, h |
| 13-7.c | 3 | 7 11 19 29 37 59 62 | 55 | 15, 24, … | 12, 27, 0, 3 | f |
| 13-7.d | 4 | 7 11 19 29 37 41 60 | 56 | 15, 27, … | 16, 21, 4, 2 | c, g, k, m |
| 13-7.e | 5 | 7 11 13 19 46 49 63 | 58 | 15, 28, … | 22, 15, 6, 2 | b, g, h, j, l |
| 13-7.f | 6 | 7 11 19 30 37 41 52 | 55 | 16, 22, … | 17, 15, 9, 1 | d, f, i, m |
| 13-7.g | 7 | 7 11 13 19 37 57 63 | 56 | 16, 24, … | 18, 18, 4, 3 | c, e, p |
| 13-7.h | 8 | 7 11 19 37 41 60 63 | 54 | 16, 26, … | 12, 23, 5, 0, 1 | g, k, n |
| 13-7.i | * | 7 11 19 29 30 37 41 | 54 | 16, 28, … | 12, 23, 5, 0, 1 | g, m, o |
| 13-7.j | * | 7 11 13 19 37 49 63 | 55 | 17, 21, … | 19, 12, 9, 2 | d, i, k, l, p |

| Design | csw # | Generators | d.f. | $w_4, w_5, w_6, \ldots$ | Alias Length Pattern | E/O Proj. |
|---|---|---|---|---|---|---|
| 13-7.k | * | 7 11 13 19 35 53 57 | 54 | 17, 24, … | 19, 12, 9, 2 | e, g, j, n, p, q |
| 13-7.l | * | 7 11 19 30 37 41 49 | 52 | 18, 20, 24, … | 12, 18, 6, 3 | k, m |
| 13-7.m | 9 | 7 11 19 29 37 41 47 | 54 | 18, 20, 28, … | 20, 6, 14, 1 | i, m, r |
| 13-7.n | 10 | 7 11 13 19 35 49 63 | 55 | 18, 21, 24, … | 21, 8, 12, 0, 1 | f, l, q |
| 13-7.o | * | 7 11 19 29 37 41 49 | 52 | 18, 21, 24, … | 12, 18, 6, 3 | m |
| 13-7.p | * | 7 11 13 19 21 41 54 | 54 | 19, 19, … | 20, 9, 8, 4 | i, k, l, p, t, n |
| 13-7.q | * | 7 11 13 19 21 46 54 | 54 | 19, 20, … | 20, 9, 8, 4 | l, u |
| 13-7.r | * | 7 11 13 19 35 53 54 | 50 | 19, 24, … | 6, 24, 6, 0, 0, 1 | s, q, o, n |
| 13-7.s | * | 7 11 13 19 21 35 57 | 52 | 20, 18, … | 16, 11, 9, 2, 1 | k, m, p, q, t |
| 13-7.t | * | 7 11 13 14 19 37 57 | 52 | 22, 16, … | 16, 16, 0, 5, 2 | p, v |
| 13-7.u | * | 7 11 13 14 19 35 53 | 50 | 23, 16, … | 12, 18, 0, 6, 0, 1 | q, v |
| 13-7.v | * | 7 11 13 19 21 25 46 | 51 | 25, 13, … | 23, 0, 5, 10 | r, t, u |
| 13-7.w | * | 7 11 13 14 19 21 57 | 51 | 26, 12, … | 23, 0, 8, 4, 3 | t, v |
| 13-7.x | * | 7 11 13 14 19 21 54 | 51 | 26, 13, … | 23, 0, 8, 4, 3 | u, v |
| 12-6.a | 1 | 7 11 29 45 51 62 | 62 | 6, 24, … | 36, 12, 2 | a |
| 12-6.b | 2 | 7 11 21 46 54 56 | 57 | 8, 20, … | 27, 15, 3 | a, c, d, e |
| 12-6.c | 3 | 7 11 21 41 51 63 | 55 | 9, 18, … | 24, 15, 4 | c, h |
| 12-6.d | 4 | 7 11 21 41 54 56 | 53 | 10, 15, … | 21, 15, 5 | b, d, h |

| Design | CSW # | Generators | d.f. | $w_4, w_5, w_6, \ldots$ | Alias Length Pattern | E/O Proj. |
|---|---|---|---|---|---|---|
| 12-6.e | 6 | 7 11 19 37 57 63 | 53 | 10, 16, 12, … | 20, 18, 2, 1 | c, g, j |
| 12-6.f | 7 | 7 11 19 29 37 59 | 53 | 10, 16, 16, … | 20, 18, 2, 1 | d, f, l |
| 12-6.g | 8 | 7 11 19 29 37 57 | 53 | 10, 18, … | 20, 18, 2, 1 | c, e, h, i, j, l |
| 12-6.h | 5 | 7 11 13 30 46 49 | 56 | 10, 20, … | 30, 6, 8 | a, e, k, m |
| 12-6.i | 9 | 7 11 21 25 38 58 | 52 | 11, 14, … | 21, 12, 7 | d, g, h, o |
| 12-6.j | * | 7 11 19 37 57 60 | 51 | 11, 16, … | 16, 21, 0, 2 | e, j |
| 12-6.k | * | 7 11 19 37 41 60 | 50 | 12, 13, … | 17, 15, 5, 1 | h, j, n, o |
| 12-6.l | 10 | 7 11 13 19 46 49 | 52 | 12, 14, 12, … | 23, 9, 7, 1 | d, h, j, k, p, r |
| 12-6.m | * | 7 11 19 29 37 41 | 50 | 12, 14, 12, … | 17, 15, 5, 1 | h, l, o |
| 12-6.n | * | 7 11 19 37 57 58 | 49 | 12, 16, … | 12, 23, 1, 0, 1 | i, j, r |
| 12-6.o | * | 7 11 19 29 30 37 | 49 | 12, 20, … | 12, 23, 1, 0, 1 | i, l, s |
| 12-6.p | * | 7 11 13 19 37 57 | 50 | 13, 12, … | 19, 12, 5, 2 | g, h, j, p |
| 12-6.q | * | 7 11 13 19 35 53 | 48 | 14, 12, … | 15, 14, 6, 0, 1 | j, l, p, q |
| 12-6.r | * | 7 11 21 25 31 45 | 48 | 15, 10, … | 21, 0, 15 | o |
| 12-6.s | * | 7 11 19 29 30 35 | 43 | 15, 16, … | 0, 30, 0, 0, 0, 1 | q, s |
| 12-6.t | * | 7 11 13 19 21 57 | 48 | 16, 9, … | 21, 3, 9, 3 | n, o, p |
| 12-6.u | * | 7 11 13 19 21 46 | 48 | 16, 10, … | 21, 3, 9, 3 | r, p, o |
| 12-6.v | * | 7 11 13 14 19 53 | 48 | 18, 8, … | 21, 8, 0, 6, 1 | p, t |

| Design | csw # | Generators | d.f. | $w_4, w_5, w_6, \ldots$ | Alias Length Pattern | E/O Proj. |
|---|---|---|---|---|---|---|
| 11-5.a | 1 | 7 11 29 45 51 | 55 | 4, 14, … | 34, 9, 1 | a, c, f |
| 11-5.b | 2 | 7 25 42 52 63 | 51 | 5, 10, … | 25, 15 | b |
| 11-5.c | 3 | 7 11 29 46 49 | 52 | 5, 12, … | 28, 12, 1 | a, b, d, e |
| 11-5.d | 4 | 7 11 21 46 56 | 50 | 6, 10, … | 25, 12, 2 | b, c, e, h |
| 11-5.e | 5 | 7 11 29 45 49 | 50 | 6, 12, 4, … | 25, 12, 2 | a, e, f |
| 11-5.f | 6 | 7 11 19 29 62 | 51 | 6, 12, 8, … | 27, 12, 0, 1 | c, j |
| 11-5.g | 7 | 7 11 21 38 57 | 48 | 7, 8, … | 22, 12, 3 | b, g |
| 11-5.h | 8 | 7 11 21 41 51 | 48 | 7, 9, … | 22, 12, 3 | b, e, g, h |
| 11-5.i | * | 7 11 19 29 45 | 48 | 7, 12, … | 21, 15, 0, 1 | d, e, f, i, j |
| 11-5.j | * | 7 11 19 37 57 | 46 | 8, 8, … | 18, 15, 1, 1 | e, g, i |
| 11-5.k | 9 | 7 11 13 30 49 | 49 | 8, 10, 4, … | 28, 3, 7 | c, e, k, l |
| 11-5.l | * | 7 11 19 29 37 | 46 | 8, 10, 4, … | 18, 15, 1, 1 | e, h, j |
| 11-5.m | 10 | 7 11 13 30 46 | 49 | 8, 14, … | 28, 3, 7 | f, l |
| 11-5.n | * | 7 11 21 25 63 | 45 | 9, 6, … | 19, 9, 6 | g |
| 11-5.o | * | 7 11 21 25 45 | 45 | 9, 7, … | 19, 9, 6 | g, h |
| 11-5.p | * | 7 11 13 19 53 | 45 | 10, 6, … | 21, 6, 6, 1 | g, h, i, k |
| 11-5.q | * | 7 11 19 29 35 | 42 | 10, 8, 0, … | 10, 20, 0, 0, 1 | i, j |
| 11-5.r | * | 7 11 13 19 46 | 45 | 10, 8, 4, … | 21, 6, 6, 1 | j |

| Design | CSW # | Generators | d.f. | $w_4, w_5, w_6, \ldots$ | Alias Length Pattern | E/O Proj. |
|---|---|---|---|---|---|---|
| 11-5.s | * | 7 11 19 29 30 | 42 | 10, 16, … | 10, 20, 0, 0, 1 | k |
| 11-5.t | * | 7 11 13 14 51 | 45 | 14, 4, … | 27, 0, 0, 7 | h, i, l |
| 10-4.a | 1 | 7 27 43 53 | 49 | 2, 8, … | 33, 6 | a, c |
| 10-4.b | 2 | 7 25 42 53 | 46 | 3, 6, … | 27, 9 | a, b |
| 10-4.c | 3 | 7 11 29 51 | 47 | 3, 7, … | 30, 6, 1 | a, e, f |
| 10-4.d | 4 | 7 11 29 46 | 47 | 3, 8, … | 30, 6, 1 | a, f |
| 10-4.e | 5 | 7 11 29 49 | 44 | 4, 6, … | 24, 9, 1 | a, b, c, d, f |
| 10-4.f | 6 | 7 11 29 45 | 44 | 4, 8, … | 24, 9, 1 | c, f |
| 10-4.g | 8 | 7 11 21 57 | 42 | 5, 4, … | 21, 9, 2 | b, d |
| 10-4.h | 9 | 7 11 21 45 | 42 | 5, 5, … | 21, 9, 2 | b, d, e, f |
| 10-4.i | * | 7 11 19 45 | 40 | 6, 4, … | 17, 12, 0, 1 | d, f |
| 10-4.j | * | 7 11 19 29 | 40 | 6, 8, … | 17, 12, 0, 1 | f |
| 10-4.k | * | 7 11 13 51 | 41 | 7, 3, … | 24, 0, 7 | d, e |
| 10-4.l | * | 7 11 13 30 | 41 | 7, 7, … | 24, 0, 7 | f |
| 9-3.a | 1 | 7 27 45 | 42 | 1, 4, … | 30, 3 | a, c |
| 9-3.b | 2 | 7 25 43 | 39 | 2, 3, … | 24, 6 | a, b, c |
| 9-3.c | 3 | 7 27 43 | 39 | 2, 4, … | 24, 6 | c |
| 9-3.d | 6 | 7 11 53 | 37 | 3, 2, … | 21, 6, 1 | b, c |

| Design | csw # | Generators | d.f. | $w_4, w_5, w_6, \ldots$ | Alias Length Pattern | E/O Proj. |
|---|---|---|---|---|---|---|
| 9-3.e | 7 | 7 11 51 | 37 | 3, 3, … | 21, 6, 1 | c |
| 9-3.f | 8 | 7 11 29 | 37 | 3, 4, … | 21, 6, 1 | c |
| 8-2.a | 1 | 15 51 | 36 | 0, 2, 1, … | 28 | - |
| 8-2.b | * | 7 57 | 33 | 1, 1, … | 22, 3 | - |
| 8-2.c | * | 7 27 | 33 | 1, 2, … | 22, 3 | - |

# Appendix C: Catalog of Designs, $n = 128$

k = 8, Designs sorted based on word length pattern

| Design | wlp ($w_4$,...) | | | | | wlp rank | alp | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8-1.1 | 0 | 0 | 0 | 0 | 1 | 1 | 28 | 0 | 0 | 0 | 36 | 28 | 1 | 1 | 1 | 1 | 55.0998 | 1 |
| 8-1.2 | 0 | 0 | 0 | 1 | 0 | 2 | 28 | 0 | 0 | 0 | 36 | 28 | 1 | 2 | 2 | 2 | 55.0998 | 2 |
| 8-1.3 | 0 | 0 | 1 | 0 | 0 | 3 | 28 | 0 | 0 | 0 | 36 | 28 | 1 | 3 | 3 | 3 | 55.0999 | 3 |
| 8-1.4 | 0 | 1 | 0 | 0 | 0 | 4 | 28 | 0 | 0 | 0 | 36 | 28 | 1 | 4 | 4 | 4 | 55.1007 | 4 |
| 8-1.5 | 1 | 0 | 0 | 0 | 0 | 5 | 22 | 3 | 0 | 0 | 33 | 22 | 2 | 5 | 5 | 5 | 55.1082 | 5 |

k = 8, Design generators

| Design | Design Generators |
|---|---|
| 8-1.1 | 127 |
| 8-1.2 | 63 |
| 8-1.3 | 121 |
| 8-1.4 | 15 |
| 8-1.5 | 7 |

k = 9, Designs sorted based on word length pattern

| Design | wlp ($w_4$,…) | | | | | | wlp rank | alp | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-2.1 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 45 | 36 | 1 | 1 | 1 | 1 | 49.5901 | 1 |
| 9-2.2 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 36 | 0 | 0 | 0 | 45 | 36 | 1 | 2 | 2 | 2 | 49.5908 | 2 |
| 9-2.3 | 0 | 2 | 0 | 0 | 1 | 0 | 3 | 36 | 0 | 0 | 0 | 45 | 36 | 1 | 3 | 3 | 3 | 49.5915 | 3 |
| 9-2.4 | 0 | 2 | 1 | 0 | 0 | 0 | 4 | 36 | 0 | 0 | 0 | 45 | 36 | 1 | 4 | 4 | 4 | 49.5916 | 4 |
| 9-2.5 | 1 | 0 | 0 | 2 | 0 | 0 | 5 | 30 | 3 | 0 | 0 | 42 | 30 | 2 | 5 | 5 | 5 | 49.5974 | 5 |
| 9-2.6 | 1 | 0 | 1 | 0 | 1 | 0 | 6 | 30 | 3 | 0 | 0 | 42 | 30 | 2 | 6 | 6 | 6 | 49.5975 | 6 |
| 9-2.7 | 1 | 0 | 2 | 0 | 0 | 0 | 7 | 30 | 3 | 0 | 0 | 42 | 30 | 2 | 7 | 7 | 7 | 49.5976 | 7 |
| 9-2.8 | 1 | 1 | 0 | 0 | 0 | 1 | 8 | 30 | 3 | 0 | 0 | 42 | 30 | 2 | 8 | 8 | 8 | 49.5982 | 8 |
| 9-2.9 | 1 | 1 | 0 | 1 | 0 | 0 | 9 | 30 | 3 | 0 | 0 | 42 | 30 | 2 | 9 | 9 | 9 | 49.5982 | 9 |
| 9-2.10 | 1 | 2 | 0 | 0 | 0 | 0 | 10 | 30 | 3 | 0 | 0 | 42 | 30 | 2 | 10 | 10 | 10 | 49.5991 | 10 |
| 9-2.11 | 2 | 0 | 0 | 0 | 1 | 0 | 11 | 24 | 6 | 0 | 0 | 39 | 24 | 2 | 11 | 11 | 11 | 49.6049 | 11 |
| 9-2.12 | 2 | 0 | 1 | 0 | 0 | 0 | 12 | 24 | 6 | 0 | 0 | 39 | 24 | 2 | 12 | 12 | 12 | 49.6050 | 12 |
| 9-2.13 | 3 | 0 | 0 | 0 | 0 | 0 | 13 | 21 | 6 | 1 | 0 | 37 | 21 | 3 | 13 | 13 | 13 | 49.6125 | 13 |

k = 9, Design generators

| Design | Design Generators |
|---|---|
| 9-2.1 | 31 121 |
| 9-2.2 | 15 121 |
| 9-2.3 | 15 120 |
| 9-2.4 | 15 51 |
| 9-2.5 | 7 123 |
| 9-2.6 | 7 121 |
| 9-2.7 | 7 59 |
| 9-2.8 | 7 120 |
| 9-2.9 | 7 57 |
| 9-2.10 | 7 27 |
| 9-2.11 | 7 112 |
| 9-2.12 | 7 25 |
| 9-2.13 | 7 11 |

k = 10, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-3.1 | 0 | 3 | 3 | 1 | 45 | 0 | 0 | 0 | 0 | 55 | 45 | 1 | 1 | 1 | 1 | 44.6334 | 1 |
| 10-3.2 | 0 | 4 | 2 | 2 | 45 | 0 | 0 | 0 | 0 | 55 | 45 | 1 | 2 | 2 | 2 | 44.6340 | 2 |
| 10-3.3 | 1 | 0 | 6 | 3 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 3 | 3 | 3 | 44.6381 | 3 |
| 10-3.4a | 1 | 2 | 2 | 4 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 4 | 4 | 4 | 44.6393 | 4 |
| 10-3.4b | 1 | 2 | 2 | 4 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 4 | 4 | 4 | 44.6393 | 4 |
| 10-3.6 | 1 | 3 | 1 | 6 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 6 | 6 | 6 | 44.6400 | 6 |
| 10-3.7 | 1 | 3 | 2 | 7 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 7 | 7 | 7 | 44.6401 | 7 |
| 10-3.8 | 1 | 4 | 0 | 8 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 8 | 8 | 8 | 44.6407 | 8 |
| 10-3.9 | 1 | 4 | 1 | 9 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 9 | 9 | 9 | 44.6408 | 9 |
| 10-3.10 | 1 | 4 | 2 | 10 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 10 | 10 | 10 | 44.6408 | 10 |
| 10-3.11a | 2 | 0 | 4 | 11 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 11 | 11 | 11 | 44.6448 | 11 |
| 10-3.11b | 2 | 0 | 4 | 11 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 11 | 11 | 11 | 44.6448 | 11 |
| 10-3.13 | 2 | 1 | 1 | 13 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 13 | 13 | 13 | 44.6453 | 13 |
| 10-3.14 | 2 | 2 | 0 | 14 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 14 | 14 | 14 | 44.6460 | 14 |
| 10-3.15 | 2 | 2 | 1 | 15 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 15 | 15 | 15 | 44.6461 | 15 |
| 10-3.16 | 2 | 3 | 1 | 16 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 16 | 16 | 16 | 44.6468 | 16 |
| 10-3.17 | 2 | 4 | 0 | 17 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 17 | 17 | 17 | 44.6475 | 17 |
| 10-3.18 | 3 | 0 | 0 | 18 | 30 | 6 | 1 | 0 | 0 | 47 | 30 | 3 | 18 | 18 | 21 | 44.6513 | 18 |
| 10-3.19 | 3 | 0 | 2 | 19 | 30 | 6 | 1 | 0 | 0 | 47 | 30 | 3 | 19 | 19 | 22 | 44.6514 | 19 |
| 10-3.20 | 3 | 0 | 2 | 19 | 27 | 9 | 0 | 0 | 0 | 46 | 27 | 2 | 26 | 26 | 18 | 44.6514 | 19 |

k = 10, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-3.1 | 0 | 3 | 3 | 1 | 45 | 0 | 0 | 0 | 0 | 55 | 45 | 1 | 1 | 1 | 1 | 44.6334 | 1 |
| 10-3.2 | 0 | 4 | 2 | 2 | 45 | 0 | 0 | 0 | 0 | 55 | 45 | 1 | 2 | 2 | 2 | 44.6340 | 2 |
| 10-3.3 | 1 | 0 | 6 | 3 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 3 | 3 | 3 | 44.6381 | 3 |
| 10-3.4b | 1 | 2 | 2 | 4 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 4 | 4 | 4 | 44.6393 | 4 |
| 10-3.4a | 1 | 2 | 2 | 4 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 4 | 4 | 4 | 44.6393 | 4 |
| 10-3.6 | 1 | 3 | 1 | 6 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 6 | 6 | 6 | 44.6400 | 6 |
| 10-3.7 | 1 | 3 | 2 | 7 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 7 | 7 | 7 | 44.6401 | 7 |
| 10-3.8 | 1 | 4 | 0 | 8 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 8 | 8 | 8 | 44.6407 | 8 |
| 10-3.9 | 1 | 4 | 1 | 9 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 9 | 9 | 9 | 44.6408 | 9 |
| 10-3.10 | 1 | 4 | 2 | 10 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 10 | 10 | 10 | 44.6408 | 10 |
| 10-3.11b | 2 | 0 | 4 | 11 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 11 | 11 | 11 | 44.6448 | 11 |
| 10-3.11a | 2 | 0 | 4 | 11 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 11 | 11 | 11 | 44.6448 | 11 |
| 10-3.13 | 2 | 1 | 1 | 13 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 13 | 13 | 13 | 44.6453 | 13 |
| 10-3.14 | 2 | 2 | 0 | 14 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 14 | 14 | 14 | 44.6460 | 14 |
| 10-3.15 | 2 | 2 | 1 | 15 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 15 | 15 | 15 | 44.6461 | 15 |
| 10-3.16 | 2 | 3 | 1 | 16 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 16 | 16 | 16 | 44.6468 | 16 |
| 10-3.17 | 2 | 4 | 0 | 17 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 17 | 17 | 17 | 44.6475 | 17 |
| 10-3.18 | 3 | 0 | 0 | 18 | 30 | 6 | 1 | 0 | 0 | 47 | 30 | 3 | 18 | 18 | 21 | 44.6513 | 18 |
| 10-3.19 | 3 | 0 | 2 | 19 | 30 | 6 | 1 | 0 | 0 | 47 | 30 | 3 | 19 | 19 | 22 | 44.6514 | 19 |
| 10-3.21 | 3 | 0 | 3 | 21 | 30 | 6 | 1 | 0 | 0 | 47 | 30 | 3 | 20 | 20 | 23 | 44.6515 | 21 |

k = 10, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-3.1 | 0 | 3 | 3 | 1 | 45 | 0 | 0 | 0 | 0 | 55 | 45 | 1 | 1 | 1 | 1 | 44.6334 | 1 |
| 10-3.2 | 0 | 4 | 2 | 2 | 45 | 0 | 0 | 0 | 0 | 55 | 45 | 1 | 2 | 2 | 2 | 44.6340 | 2 |
| 10-3.3 | 1 | 0 | 6 | 3 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 3 | 3 | 3 | 44.6381 | 3 |
| 10-3.4a | 1 | 2 | 2 | 4 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 4 | 4 | 4 | 44.6393 | 4 |
| 10-3.4b | 1 | 2 | 2 | 4 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 4 | 4 | 4 | 44.6393 | 4 |
| 10-3.6 | 1 | 3 | 1 | 6 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 6 | 6 | 6 | 44.6400 | 6 |
| 10-3.7 | 1 | 3 | 2 | 7 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 7 | 7 | 7 | 44.6401 | 7 |
| 10-3.8 | 1 | 4 | 0 | 8 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 8 | 8 | 8 | 44.6407 | 8 |
| 10-3.9 | 1 | 4 | 1 | 9 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 9 | 9 | 9 | 44.6408 | 9 |
| 10-3.10 | 1 | 4 | 2 | 10 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 10 | 10 | 10 | 44.6408 | 10 |
| 10-3.11a | 2 | 0 | 4 | 11 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 11 | 11 | 11 | 44.6448 | 11 |
| 10-3.11b | 2 | 0 | 4 | 11 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 11 | 11 | 11 | 44.6448 | 11 |
| 10-3.13 | 2 | 1 | 1 | 13 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 13 | 13 | 13 | 44.6453 | 13 |
| 10-3.14 | 2 | 2 | 0 | 14 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 14 | 14 | 14 | 44.6460 | 14 |
| 10-3.15 | 2 | 2 | 1 | 15 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 15 | 15 | 15 | 44.6461 | 15 |
| 10-3.16 | 2 | 3 | 1 | 16 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 16 | 16 | 16 | 44.6468 | 16 |
| 10-3.17 | 2 | 4 | 0 | 17 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 17 | 17 | 17 | 44.6475 | 17 |
| 10-3.18 | 3 | 0 | 0 | 18 | 30 | 6 | 1 | 0 | 0 | 47 | 30 | 3 | 18 | 18 | 21 | 44.6513 | 18 |
| 10-3.19 | 3 | 0 | 2 | 19 | 30 | 6 | 1 | 0 | 0 | 47 | 30 | 3 | 19 | 19 | 22 | 44.6514 | 19 |
| 10-3.21 | 3 | 0 | 3 | 21 | 30 | 6 | 1 | 0 | 0 | 47 | 30 | 3 | 20 | 20 | 23 | 44.6515 | 21 |

k = 10, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-3.1 | 0 | 3 | 3 | 1 | 45 | 0 | 0 | 0 | 0 | 55 | 45 | 1 | 1 | 1 | 1 | 44.6334 | 1 |
| 10-3.2 | 0 | 4 | 2 | 2 | 45 | 0 | 0 | 0 | 0 | 55 | 45 | 1 | 2 | 2 | 2 | 44.6340 | 4 |
| 10-3.3 | 1 | 0 | 6 | 3 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 3 | 3 | 3 | 44.6381 | 3 |
| 10-3.4b | 1 | 2 | 2 | 4 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 4 | 4 | 4 | 44.6393 | 5 |
| 10-3.4a | 1 | 2 | 2 | 4 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 4 | 4 | 4 | 44.6393 | 4 |
| 10-3.6 | 1 | 3 | 1 | 6 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 6 | 6 | 6 | 44.6400 | 6 |
| 10-3.7 | 1 | 3 | 2 | 7 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 7 | 7 | 7 | 44.6401 | 7 |
| 10-3.8 | 1 | 4 | 0 | 8 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 8 | 8 | 8 | 44.6407 | 8 |
| 10-3.9 | 1 | 4 | 1 | 9 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 9 | 9 | 9 | 44.6408 | 9 |
| 10-3.10 | 1 | 4 | 2 | 10 | 39 | 3 | 0 | 0 | 0 | 52 | 39 | 2 | 10 | 10 | 10 | 44.6408 | 10 |
| 10-3.11b | 2 | 0 | 4 | 11 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 11 | 11 | 11 | 44.6448 | 11 |
| 10-3.11a | 2 | 0 | 4 | 11 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 11 | 11 | 11 | 44.6448 | 11 |
| 10-3.13 | 2 | 1 | 1 | 13 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 13 | 13 | 13 | 44.6453 | 13 |
| 10-3.14 | 2 | 2 | 0 | 14 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 14 | 14 | 14 | 44.6460 | 14 |
| 10-3.15 | 2 | 2 | 1 | 15 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 15 | 15 | 15 | 44.6461 | 15 |
| 10-3.16 | 2 | 3 | 1 | 16 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 16 | 16 | 16 | 44.6468 | 16 |
| 10-3.17 | 2 | 4 | 0 | 17 | 33 | 6 | 0 | 0 | 0 | 49 | 33 | 2 | 17 | 17 | 17 | 44.6475 | 17 |
| 10-3.20 | 3 | 0 | 2 | 19 | 27 | 9 | 0 | 0 | 0 | 46 | 27 | 2 | 26 | 26 | 18 | 44.6514 | 19 |
| 10-3.22 | 3 | 0 | 3 | 21 | 27 | 9 | 0 | 0 | 0 | 46 | 27 | 2 | 27 | 27 | 19 | 44.6515 | 21 |
| 10-3.24 | 3 | 0 | 4 | 23 | 27 | 9 | 0 | 0 | 0 | 46 | 27 | 2 | 28 | 28 | 20 | 44.6516 | 23 |

k = 10, Design generators

| Design | Design Generators |
|---|---|
| 10-3.1 | 15 51 121 |
| 10-3.2 | 15 51 120 |
| 10-3.3 | 7 59 93 |
| 10-3.4a | 7 27 109 |
| 10-3.4b | 7 57 90 |
| 10-3.6 | 7 27 121 |
| 10-3.7 | 7 27 120 |
| 10-3.8 | 7 27 101 |
| 10-3.9 | 7 27 99 |
| 10-3.10 | 7 27 45 |
| 10-3.11a | 7 26 121 |
| 10-3.11b | 7 59 112 |
| 10-3.13 | 7 25 106 |
| 10-3.14 | 7 27 112 |
| 10-3.15 | 7 25 120 |
| 10-3.16 | 7 25 43 |
| 10-3.17 | 7 51 112 |
| 10-3.18 | 7 11 125 |
| 10-3.19 | 7 121 122 |
| 10-3.20 | 7 112 121 |
| 10-3.21 | 7 11 115 |
| 10-3.22 | 7 25 97 |
| 10-3.24 | 7 25 42 |

k = 11, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11-4.1 | 0 | 6 | 6 | 1 | 55 | 0 | 0 | 0 | 0 | 66 | 55 | 1 | 1 | 1 | 1 | 40.1723 | 1 |
| 11-4.2 | 1 | 4 | 6 | 2 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 2 | 2 | 2 | 40.1771 | 2 |
| 11-4.3 | 1 | 5 | 6 | 3 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 3 | 3 | 3 | 40.1778 | 3 |
| 11-4.4 | 1 | 6 | 4 | 4 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 4 | 4 | 4 | 40.1783 | 4 |
| 11-4.5 | 1 | 6 | 5 | 5 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 5 | 5 | 5 | 40.1784 | 5 |
| 11-4.6 | 1 | 6 | 6 | 6 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 6 | 6 | 6 | 40.1784 | 6 |
| 11-4.7 | 1 | 7 | 4 | 7 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 7 | 7 | 7 | 40.1789 | 7 |
| 11-4.8 | 2 | 0 | 12 | 8 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 8 | 8 | 8 | 40.1809 | 8 |
| 11-4.9a | 2 | 4 | 4 | 9 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 9 | 9 | 9 | 40.1831 | 9 |
| 11-4.9b | 2 | 4 | 4 | 9 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 9 | 9 | 9 | 40.1831 | 9 |
| 11-4.9c | 2 | 4 | 4 | 9 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 9 | 9 | 9 | 40.1831 | 9 |
| 11-4.12 | 2 | 5 | 4 | 12 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 12 | 12 | 12 | 40.1837 | 12 |
| 11-4.13a | 2 | 6 | 2 | 13 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 13 | 13 | 13 | 40.1843 | 13 |
| 11-4.13b | 2 | 6 | 2 | 13 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 13 | 13 | 13 | 40.1843 | 13 |
| 11-4.15 | 2 | 6 | 3 | 15 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 15 | 15 | 15 | 40.1843 | 15 |
| 11-4.16 | 2 | 6 | 4 | 16 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 16 | 16 | 16 | 40.1844 | 16 |
| 11-4.17 | 2 | 8 | 4 | 17 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 17 | 17 | 17 | 40.1857 | 17 |
| 11-4.18 | 3 | 0 | 10 | 18 | 37 | 9 | 0 | 0 | 0 | 57 | 37 | 2 | 32 | 32 | 18 | 40.1869 | 18 |
| 11-4.19 | 3 | 0 | 11 | 19 | 40 | 6 | 1 | 0 | 0 | 58 | 40 | 3 | 18 | 18 | 31 | 40.1870 | 19 |
| 11-4.20 | 3 | 2 | 4 | 20 | 37 | 9 | 0 | 0 | 0 | 57 | 37 | 2 | 33 | 33 | 19 | 40.1878 | 20 |

k = 11, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11-4.1 | 0 | 6 | 6 | 1 | 55 | 0 | 0 | 0 | 0 | 66 | 55 | 1 | 1 | 1 | 1 | 40.1723 | 1 |
| 11-4.2 | 1 | 4 | 6 | 2 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 2 | 2 | 2 | 40.1771 | 2 |
| 11-4.3 | 1 | 5 | 6 | 3 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 3 | 3 | 3 | 40.1778 | 3 |
| 11-4.4 | 1 | 6 | 4 | 4 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 4 | 4 | 4 | 40.1783 | 4 |
| 11-4.5 | 1 | 6 | 5 | 5 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 5 | 5 | 5 | 40.1784 | 5 |
| 11-4.6 | 1 | 6 | 6 | 6 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 6 | 6 | 6 | 40.1784 | 6 |
| 11-4.7 | 1 | 7 | 4 | 7 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 7 | 7 | 7 | 40.1789 | 7 |
| 11-4.8 | 2 | 0 | 12 | 8 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 8 | 8 | 8 | 40.1809 | 8 |

k = 11, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11-4.1 | 0 | 6 | 6 | 1 | 55 | 0 | 0 | 0 | 0 | 66 | 55 | 1 | 1 | 1 | 1 | 40.1723 | 1 |
| 11-4.2 | 1 | 4 | 6 | 2 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 2 | 2 | 2 | 40.1771 | 2 |
| 11-4.3 | 1 | 5 | 6 | 3 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 3 | 3 | 3 | 40.1778 | 3 |
| 11-4.4 | 1 | 6 | 4 | 4 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 4 | 4 | 4 | 40.1783 | 4 |
| 11-4.5 | 1 | 6 | 5 | 5 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 5 | 5 | 5 | 40.1784 | 5 |
| 11-4.6 | 1 | 6 | 6 | 6 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 6 | 6 | 6 | 40.1784 | 6 |
| 11-4.7 | 1 | 7 | 4 | 7 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 7 | 7 | 7 | 40.1789 | 7 |
| 11-4.8 | 2 | 0 | 12 | 8 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 8 | 8 | 8 | 40.1809 | 8 |

k = 11, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11-4.1 | 0 | 6 | 6 | 1 | 55 | 0 | 0 | 0 | 0 | 66 | 55 | 1 | 1 | 1 | 1 | 40.1723 | 1 |
| 11-4.2 | 1 | 4 | 6 | 2 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 2 | 2 | 2 | 40.1771 | 2 |
| 11-4.3 | 1 | 5 | 6 | 3 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 3 | 3 | 3 | 40.1778 | 3 |
| 11-4.4 | 1 | 6 | 4 | 4 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 4 | 4 | 4 | 40.1783 | 4 |
| 11-4.5 | 1 | 6 | 5 | 5 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 5 | 5 | 5 | 40.1784 | 5 |
| 11-4.6 | 1 | 6 | 6 | 6 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 6 | 6 | 6 | 40.1784 | 6 |
| 11-4.7 | 1 | 7 | 4 | 7 | 49 | 3 | 0 | 0 | 0 | 63 | 49 | 2 | 7 | 7 | 7 | 40.1789 | 7 |
| 11-4.8 | 2 | 0 | 12 | 8 | 43 | 6 | 0 | 0 | 0 | 60 | 43 | 2 | 8 | 8 | 8 | 40.1809 | 8 |

k = 11, Design generators

| Design | Design Generators | | | |
|---|---|---|---|---|
| 11-4.1 | 15 | 51 | 85 | 120 |
| 11-4.2 | 7 | 57 | 90 | 108 |
| 11-4.3 | 7 | 27 | 45 | 120 |
| 11-4.4 | 7 | 27 | 45 | 121 |
| 11-4.5 | 7 | 27 | 45 | 85 |
| 11-4.6 | 7 | 27 | 45 | 78 |
| 11-4.7 | 7 | 27 | 61 | 120 |
| 11-4.8 | 7 | 59 | 93 | 112 |
| 11-4.9a | 7 | 26 | 45 | 121 |
| 11-4.9b | 7 | 27 | 45 | 112 |
| 11-4.9c | 7 | 51 | 93 | 112 |
| 11-4.12 | 7 | 25 | 43 | 120 |
| 11-4.13a | 7 | 27 | 60 | 121 |
| 11-4.13b | 7 | 27 | 43 | 121 |
| 11-4.15 | 7 | 27 | 58 | 121 |
| 11-4.16 | 7 | 27 | 43 | 120 |
| 11-4.17 | 7 | 51 | 85 | 112 |
| 11-4.18 | 7 | 26 | 44 | 121 |
| 11-4.19 | 7 | 11 | 61 | 94 |
| 11-4.20 | 7 | 25 | 42 | 116 |

k = 12, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-5.1 | 1 8 12 | 1 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 1 | 1 | 1 | 36.1623 | 1 |
| 12-5.2 | 1 10 10 | 2 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 2 | 2 | 2 | 36.1633 | 2 |
| 12-5.3 | 1 10 11 | 3 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 3 | 3 | 3 | 36.1634 | 3 |
| 12-5.4 | 2 7 12 | 4 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 4 | 4 | 4 | 36.1672 | 4 |
| 12-5.5 | 2 8 10 | 5 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 5 | 5 | 5 | 36.1676 | 5 |
| 12-5.6 | 2 8 12 | 6 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 6 | 6 | 6 | 36.1677 | 6 |
| 12-5.7 | 2 9 9 | 7 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 7 | 7 | 7 | 36.1682 | 7 |
| 12-5.8a | 2 10 8 | 8 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 8 | 8 | 8 | 36.1687 | 8 |
| 12-5.8b | 2 10 8 | 8 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 8 | 8 | 8 | 36.1687 | 8 |
| 12-5.10 | 2 10 10 | 10 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 10 | 10 | 10 | 36.1688 | 10 |
| 12-5.11 | 2 11 8 | 11 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 11 | 11 | 11 | 36.1693 | 12 |
| 12-5.12 | 2 12 8 | 12 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 12 | 12 | 12 | 36.1699 | 13 |
| 12-5.13 | 3 0 24 | 13 | 48 | 9 | 0 | 0 | 0 | 0 | 69 | 48 | 2 | 21 | 21 | 13 | 36.1691 | 11 |
| 12-5.14 | 3 6 10 | 14 | 48 | 9 | 0 | 0 | 0 | 0 | 69 | 48 | 2 | 22 | 22 | 14 | 36.1719 | 14 |
| 12-5.15 | 3 6 11 | 15 | 51 | 6 | 1 | 0 | 0 | 0 | 70 | 51 | 3 | 13 | 13 | 44 | 36.1720 | 15 |
| 12-5.16 | 3 7 10 | 16 | 48 | 9 | 0 | 0 | 0 | 0 | 69 | 48 | 2 | 23 | 23 | 15 | 36.1725 | 16 |
| 12-5.17 | 3 8 7 | 17 | 51 | 6 | 1 | 0 | 0 | 0 | 70 | 51 | 3 | 14 | 14 | 45 | 36.1729 | 17 |
| 12-5.18a | 3 8 7 | 17 | 48 | 9 | 0 | 0 | 0 | 0 | 69 | 48 | 2 | 24 | 24 | 16 | 36.1729 | 17 |
| 12-5.18b | 3 8 7 | 17 | 48 | 9 | 0 | 0 | 0 | 0 | 69 | 48 | 2 | 24 | 24 | 16 | 36.1729 | 17 |
| 12-5.18c | 3 8 7 | 17 | 48 | 9 | 0 | 0 | 0 | 0 | 69 | 48 | 2 | 24 | 24 | 16 | 36.1729 | 17 |

k = 12, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-5.1 | 1 8 12 | 1 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 1 | 1 | 1 | 36.1623 | 1 |
| 12-5.2 | 1 10 10 | 2 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 2 | 2 | 2 | 36.1633 | 2 |
| 12-5.3 | 1 10 11 | 3 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 3 | 3 | 3 | 36.1634 | 3 |
| 12-5.4 | 2 7 12 | 4 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 4 | 4 | 4 | 36.1672 | 4 |
| 12-5.5 | 2 8 10 | 5 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 5 | 5 | 5 | 36.1676 | 5 |
| 12-5.6 | 2 8 12 | 6 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 6 | 6 | 6 | 36.1677 | 6 |
| 12-5.7 | 2 9 9 | 7 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 7 | 7 | 7 | 36.1682 | 7 |

k = 12, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-5.1 | 1 8 12 | 1 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 1 | 1 | 1 | 36.1623 | 1 |
| 12-5.2 | 1 10 10 | 2 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 2 | 2 | 2 | 36.1633 | 2 |
| 12-5.3 | 1 10 11 | 3 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 3 | 3 | 3 | 36.1634 | 3 |
| 12-5.4 | 2 7 12 | 4 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 4 | 4 | 4 | 36.1672 | 4 |
| 12-5.5 | 2 8 10 | 5 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 5 | 5 | 5 | 36.1676 | 5 |
| 12-5.6 | 2 8 12 | 6 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 6 | 6 | 6 | 36.1677 | 6 |
| 12-5.7 | 2 9 9 | 7 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 7 | 7 | 7 | 36.1682 | 7 |

k = 12, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-5.1 | 1 8 12 | 1 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 1 | 1 | 1 | 36.1623 | 1 |
| 12-5.2 | 1 10 10 | 2 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 2 | 2 | 2 | 36.1633 | 2 |
| 12-5.3 | 1 10 11 | 3 | 60 | 3 | 0 | 0 | 0 | 0 | 75 | 60 | 2 | 3 | 3 | 3 | 36.1634 | 3 |
| 12-5.4 | 2 7 12 | 4 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 4 | 4 | 4 | 36.1672 | 4 |
| 12-5.5 | 2 8 10 | 5 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 5 | 5 | 5 | 36.1676 | 5 |
| 12-5.6 | 2 8 12 | 6 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 6 | 6 | 6 | 36.1677 | 6 |
| 12-5.7 | 2 9 9 | 7 | 54 | 6 | 0 | 0 | 0 | 0 | 72 | 54 | 2 | 7 | 7 | 7 | 36.1682 | 7 |

k = 12, Design generators

| Design | Design Generators | | | | |
|---|---|---|---|---|---|
| 12-5.1 | 7 | 57 | 90 | 108 | 119 |
| 12-5.2 | 7 | 27 | 45 | 78 | 121 |
| 12-5.3 | 7 | 27 | 45 | 86 | 120 |
| 12-5.4 | 7 | 27 | 45 | 78 | 120 |
| 12-5.5 | 7 | 27 | 45 | 94 | 112 |
| 12-5.6 | 7 | 27 | 43 | 77 | 120 |
| 12-5.7 | 7 | 25 | 43 | 77 | 120 |
| 12-5.8a | 7 | 25 | 43 | 85 | 120 |
| 12-5.8b | 7 | 27 | 43 | 85 | 120 |
| 12-5.10 | 7 | 27 | 43 | 53 | 120 |
| 12-5.11 | 7 | 27 | 45 | 62 | 120 |
| 12-5.12 | 7 | 27 | 43 | 61 | 120 |
| 12-5.13 | 7 | 59 | 93 | 110 | 112 |
| 12-5.14 | 7 | 26 | 44 | 78 | 121 |
| 12-5.15 | 7 | 11 | 53 | 86 | 120 |
| 12-5.16 | 7 | 25 | 42 | 77 | 120 |
| 12-5.17 | 7 | 29 | 46 | 121 | 122 |
| 12-5.18a | 7 | 27 | 45 | 112 | 121 |
| 12-5.18b | 7 | 26 | 45 | 77 | 121 |
| 12-5.18c | 7 | 26 | 45 | 86 | 121 |

k = 13, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13-6.1 | 2 16 18 | 1 | 66 | 6 | 0 | 0 | 0 | 0 | 85 | 66 | 2 | 1 | 1 | 1 | 32.5558 | 1 |
| 13-6.2 | 2 16 20 | 2 | 66 | 6 | 0 | 0 | 0 | 0 | 85 | 66 | 2 | 2 | 2 | 2 | 32.5559 | 2 |
| 13-6.3 | 3 12 24 | 3 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 4 | 4 | 3 | 32.5589 | 3 |
| 13-6.4 | 3 14 17 | 4 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 5 | 5 | 4 | 32.5596 | 4 |
| 13-6.5 | 3 14 18 | 5 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 6 | 6 | 5 | 32.5597 | 5 |
| 13-6.6 | 3 15 15 | 6 | 63 | 6 | 1 | 0 | 0 | 0 | 83 | 63 | 3 | 3 | 3 | 45 | 32.5600 | 6 |
| 13-6.7a | 3 15 17 | 7 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 7 | 7 | 6 | 32.5601 | 7 |
| 13-6.7b | 3 15 17 | 7 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 7 | 7 | 6 | 32.5601 | 7 |
| 13-6.9 | 3 16 15 | 9 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 9 | 9 | 8 | 32.5606 | 9 |
| 13-6.10 | 3 16 16 | 10 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 10 | 10 | 9 | 32.5606 | 10 |
| 13-6.11 | 3 17 15 | 11 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 11 | 11 | 10 | 32.5611 | 11 |
| 13-6.12 | 4 10 22 | 12 | 57 | 9 | 1 | 0 | 0 | 0 | 80 | 57 | 3 | 12 | 12 | 46 | 32.5627 | 12 |
| 13-6.13 | 4 12 16 | 13 | 54 | 12 | 0 | 0 | 0 | 0 | 79 | 54 | 2 | 29 | 30 | 11 | 32.5634 | 13 |
| 13-6.14 | 4 12 17 | 14 | 57 | 9 | 1 | 0 | 0 | 0 | 80 | 57 | 3 | 13 | 13 | 47 | 32.5635 | 14 |
| 13-6.15 | 4 12 18 | 15 | 57 | 9 | 1 | 0 | 0 | 0 | 80 | 57 | 3 | 14 | 14 | 48 | 32.5635 | 15 |
| 13-6.16 | 4 12 22 | 16 | 57 | 9 | 1 | 0 | 0 | 0 | 80 | 57 | 3 | 15 | 15 | 49 | 32.5637 | 16 |
| 13-6.17 | 4 13 16 | 17 | 54 | 12 | 0 | 0 | 0 | 0 | 79 | 54 | 2 | 30 | 31 | 12 | 32.5640 | 17 |
| 13-6.18 | 4 14 14 | 18 | 57 | 9 | 1 | 0 | 0 | 0 | 80 | 57 | 3 | 16 | 16 | 50 | 32.5644 | 19 |
| 13-6.19 | 4 14 14 | 18 | 54 | 12 | 0 | 0 | 0 | 0 | 79 | 54 | 2 | 31 | 32 | 13 | 32.5644 | 18 |
| 13-6.20 | 4 14 15 | 20 | 54 | 12 | 0 | 0 | 0 | 0 | 79 | 54 | 2 | 32 | 33 | 14 | 32.5644 | 20 |

k = 13, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13-6.1 | 2 16 18 | 1 | 66 | 6 | 0 | 0 | 0 | 0 | 85 | 66 | 2 | 1 | 1 | 1 | 32.5558 | 1 |
| 13-6.2 | 2 16 20 | 2 | 66 | 6 | 0 | 0 | 0 | 0 | 85 | 66 | 2 | 2 | 2 | 2 | 32.5559 | 2 |
| 13-6.6 | 3 15 15 | 6 | 63 | 6 | 1 | 0 | 0 | 0 | 83 | 63 | 3 | 3 | 3 | 45 | 32.5600 | 6 |
| 13-6.3 | 3 12 24 | 3 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 4 | 4 | 3 | 32.5589 | 3 |
| 13-6.4 | 3 14 17 | 4 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 5 | 5 | 4 | 32.5596 | 4 |
| 13-6.5 | 3 14 18 | 5 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 6 | 6 | 5 | 32.5597 | 5 |
| 13-6.7b | 3 15 17 | 7 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 7 | 7 | 6 | 32.5601 | 7 |
| 13-6.7a | 3 15 17 | 7 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 7 | 7 | 6 | 32.5601 | 7 |
| 13-6.9 | 3 16 15 | 9 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 9 | 9 | 8 | 32.5606 | 9 |
| 13-6.10 | 3 16 16 | 10 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 10 | 10 | 9 | 32.5606 | 10 |

k = 13, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13-6.1 | 2 16 18 | 1 | 66 | 6 | 0 | 0 | 0 | 0 | 85 | 66 | 2 | 1 | 1 | 1 | 32.5558 | 1 |
| 13-6.2 | 2 16 20 | 2 | 66 | 6 | 0 | 0 | 0 | 0 | 85 | 66 | 2 | 2 | 2 | 2 | 32.5559 | 2 |
| 13-6.6 | 3 15 15 | 6 | 63 | 6 | 1 | 0 | 0 | 0 | 83 | 63 | 3 | 3 | 3 | 45 | 32.5600 | 6 |
| 13-6.3 | 3 12 24 | 3 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 4 | 4 | 3 | 32.5589 | 3 |
| 13-6.4 | 3 14 17 | 4 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 5 | 5 | 4 | 32.5596 | 4 |
| 13-6.5 | 3 14 18 | 5 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 6 | 6 | 5 | 32.5597 | 5 |
| 13-6.7a | 3 15 17 | 7 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 7 | 7 | 6 | 32.5601 | 7 |
| 13-6.7b | 3 15 17 | 7 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 7 | 7 | 6 | 32.5601 | 7 |
| 13-6.9 | 3 16 15 | 9 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 9 | 9 | 8 | 32.5606 | 9 |
| 13-6.10 | 3 16 16 | 10 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 10 | 10 | 9 | 32.5606 | 10 |

k = 13, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13-6.1 | 2 16 18 | 1 | 66 | 6 | 0 | 0 | 0 | 0 | 85 | 66 | 2 | 1 | 1 | 1 | 32.5558 | 1 |
| 13-6.2 | 2 16 20 | 2 | 66 | 6 | 0 | 0 | 0 | 0 | 85 | 66 | 2 | 2 | 2 | 2 | 32.5559 | 2 |
| 13-6.3 | 3 12 24 | 3 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 4 | 4 | 3 | 32.5589 | 3 |
| 13-6.4 | 3 14 17 | 4 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 5 | 5 | 4 | 32.5596 | 4 |
| 13-6.5 | 3 14 18 | 5 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 6 | 6 | 5 | 32.5597 | 5 |
| 13-6.7b | 3 15 17 | 7 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 7 | 7 | 6 | 32.5601 | 7 |
| 13-6.7a | 3 15 17 | 7 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 7 | 7 | 6 | 32.5601 | 7 |
| 13-6.9 | 3 16 15 | 9 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 9 | 9 | 8 | 32.5606 | 9 |
| 13-6.10 | 3 16 16 | 10 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 10 | 10 | 9 | 32.5606 | 10 |
| 13-6.11 | 3 17 15 | 11 | 60 | 9 | 0 | 0 | 0 | 0 | 82 | 60 | 2 | 11 | 11 | 10 | 32.5611 | 11 |

k = 13, Design generators

| Design | Design Generators | | | | | |
|---|---|---|---|---|---|---|
| 13-6.1 | 7 | 27 | 43 | 85 | 102 | 120 |
| 13-6.2 | 7 | 27 | 43 | 53 | 78 | 120 |
| 13-6.3 | 7 | 27 | 43 | 77 | 117 | 120 |
| 13-6.4 | 7 | 25 | 43 | 77 | 118 | 120 |
| 13-6.5 | 7 | 25 | 42 | 77 | 118 | 120 |
| 13-6.6 | 7 | 27 | 45 | 78 | 121 | 122 |
| 13-6.7a | 7 | 25 | 42 | 53 | 78 | 120 |
| 13-6.7b | 7 | 25 | 43 | 75 | 117 | 120 |
| 13-6.9 | 7 | 25 | 43 | 77 | 110 | 120 |
| 13-6.10 | 7 | 27 | 43 | 61 | 77 | 120 |
| 13-6.11 | 7 | 25 | 43 | 75 | 109 | 120 |
| 13-6.12 | 7 | 11 | 53 | 85 | 110 | 120 |
| 13-6.13 | 7 | 26 | 44 | 78 | 119 | 121 |
| 13-6.14 | 7 | 11 | 49 | 85 | 110 | 120 |
| 13-6.15 | 7 | 11 | 53 | 85 | 102 | 120 |
| 13-6.16 | 7 | 27 | 29 | 46 | 78 | 120 |
| 13-6.17 | 7 | 25 | 42 | 53 | 86 | 120 |
| 13-6.18 | 7 | 27 | 43 | 85 | 110 | 120 |
| 13-6.19 | 7 | 25 | 43 | 53 | 95 | 120 |
| 13-6.20 | 7 | 25 | 42 | 77 | 94 | 120 |

k = 14, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14-7.1 | 3 24 36 | 1 | 73 | 9 | 0 | 0 | 0 | 0 | 0 | 96 | 73 | 2 | 1 | 1 | 1 | 29.3097 | 1 |
| 14-7.2 | 4 24 30 | 2 | 67 | 12 | 0 | 0 | 0 | 0 | 0 | 93 | 67 | 2 | 2 | 3 | 2 | 29.3138 | 2 |
| 14-7.3 | 5 22 30 | 3 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 3 | 4 | 33 | 29.3173 | 3 |
| 14-7.4 | 5 22 30 | 3 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 10 | 12 | 3 | 29.3173 | 3 |
| 14-7.5 | 5 23 27 | 5 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 4 | 5 | 34 | 29.3177 | 5 |
| 14-7.6a | 5 23 27 | 5 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 11 | 13 | 4 | 29.3177 | 5 |
| 14-7.6b | 5 23 27 | 5 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 11 | 13 | 4 | 29.3177 | 5 |
| 14-7.8a | 5 24 26 | 8 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 5 | 6 | 35 | 29.3181 | 9 |
| 14-7.8b | 5 24 26 | 8 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 5 | 6 | 35 | 29.3181 | 9 |
| 14-7.10a | 5 24 26 | 8 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 13 | 15 | 6 | 29.3181 | 8 |
| 14-7.10b | 5 24 26 | 8 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 13 | 15 | 6 | 29.3181 | 8 |
| 14-7.12 | 5 24 28 | 12 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 7 | 8 | 37 | 29.3182 | 12 |
| 14-7.13 | 5 26 26 | 13 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 8 | 9 | 38 | 29.3190 | 13 |
| 14-7.14 | 6 17 40 | 14 | 61 | 12 | 2 | 0 | 0 | 0 | 0 | 89 | 61 | 3 | 15 | 17 | 39 | 29.3198 | 14 |
| 14-7.15 | 6 20 28 | 15 | 61 | 12 | 2 | 0 | 0 | 0 | 0 | 89 | 61 | 3 | 16 | 18 | 40 | 29.3207 | 15 |
| 14-7.16 | 6 20 28 | 15 | 58 | 15 | 1 | 0 | 0 | 0 | 0 | 88 | 58 | 3 | 31 | 33 | 41 | 29.3207 | 15 |
| 14-7.17a | 6 20 28 | 15 | 55 | 18 | 0 | 0 | 0 | 0 | 0 | 87 | 55 | 2 | 51 | 69 | 8 | 29.3207 | 15 |
| 14-7.17b | 6 20 28 | 15 | 55 | 18 | 0 | 0 | 0 | 0 | 0 | 87 | 55 | 2 | 51 | 69 | 8 | 29.3207 | 15 |
| 14-7.19a | 6 20 30 | 19 | 55 | 18 | 0 | 0 | 0 | 0 | 0 | 87 | 55 | 2 | 53 | 71 | 10 | 29.3208 | 19 |
| 14-7.19b | 6 20 30 | 19 | 55 | 18 | 0 | 0 | 0 | 0 | 0 | 87 | 55 | 2 | 53 | 71 | 10 | 29.3208 | 19 |

k = 14, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14-7.1 | 3 24 36 | 1 | 73 | 9 | 0 | 0 | 0 | 0 | 0 | 96 | 73 | 2 | 1 | 1 | 1 | 29.3097 | 1 |
| 14-7.2 | 4 24 30 | 2 | 67 | 12 | 0 | 0 | 0 | 0 | 0 | 93 | 67 | 2 | 2 | 3 | 2 | 29.3138 | 2 |
| 14-7.3 | 5 22 30 | 3 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 3 | 4 | 33 | 29.3173 | 3 |
| 14-7.5 | 5 23 27 | 5 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 4 | 5 | 34 | 29.3177 | 5 |
| 14-7.8b | 5 24 26 | 8 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 5 | 6 | 35 | 29.3181 | 9 |
| 14-7.8a | 5 24 26 | 8 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 5 | 6 | 35 | 29.3181 | 9 |
| 14-7.12 | 5 24 28 | 12 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 7 | 8 | 37 | 29.3182 | 12 |
| 14-7.13 | 5 26 26 | 13 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 8 | 9 | 38 | 29.3190 | 13 |
| 14-7.94 | 7 21 21 | 94 | 70 | 0 | 7 | 0 | 0 | 0 | 0 | 91 | 70 | 3 | 9 | 2 | 98 | 29.3253 | 93 |
| 14-7.4 | 5 22 30 | 3 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 10 | 12 | 3 | 29.3173 | 3 |

k = 14, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14-7.1 | 3 24 36 | 1 | 73 | 9 | 0 | 0 | 0 | 0 | 0 | 96 | 73 | 2 | 1 | 1 | 1 | 29.3097 | 1 |
| 14-7.94 | 7 21 21 | 94 | 70 | 0 | 7 | 0 | 0 | 0 | 0 | 91 | 70 | 3 | 9 | 2 | 98 | 29.3253 | 93 |
| 14-7.2 | 4 24 30 | 2 | 67 | 12 | 0 | 0 | 0 | 0 | 0 | 93 | 67 | 2 | 2 | 3 | 2 | 29.3138 | 2 |
| 14-7.3 | 5 22 30 | 3 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 3 | 4 | 33 | 29.3173 | 3 |
| 14-7.5 | 5 23 27 | 5 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 4 | 5 | 34 | 29.3177 | 5 |
| 14-7.8a | 5 24 26 | 8 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 5 | 6 | 35 | 29.3181 | 9 |
| 14-7.8b | 5 24 26 | 8 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 5 | 6 | 35 | 29.3181 | 9 |
| 14-7.12 | 5 24 28 | 12 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 7 | 8 | 37 | 29.3182 | 12 |
| 14-7.13 | 5 26 26 | 13 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 91 | 64 | 3 | 8 | 9 | 38 | 29.3190 | 13 |
| 14-7.216 | 8 21 18 | 216 | 64 | 3 | 7 | 0 | 0 | 0 | 0 | 88 | 64 | 3 | 50 | 10 | 204 | 29.3296 | 216 |

k = 14, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14-7.1 | 3 24 36 | 1 | 73 | 9 | 0 | 0 | 0 | 0 | 0 | 96 | 73 | 2 | 1 | 1 | 1 | 29.3097 | 1 |
| 14-7.2 | 4 24 30 | 2 | 67 | 12 | 0 | 0 | 0 | 0 | 0 | 93 | 67 | 2 | 2 | 3 | 2 | 29.3138 | 2 |
| 14-7.4 | 5 22 30 | 3 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 10 | 12 | 3 | 29.3173 | 3 |
| 14-7.6b | 5 23 27 | 5 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 11 | 13 | 4 | 29.3177 | 5 |
| 14-7.6a | 5 23 27 | 5 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 11 | 13 | 4 | 29.3177 | 5 |
| 14-7.10b | 5 24 26 | 8 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 13 | 15 | 6 | 29.3181 | 8 |
| 14-7.10a | 5 24 26 | 8 | 61 | 15 | 0 | 0 | 0 | 0 | 0 | 90 | 61 | 2 | 13 | 15 | 6 | 29.3181 | 8 |

k = 14, Design generators

| Design | Design Generators | | | | | | |
|---|---|---|---|---|---|---|---|
| 14-7.1 | 7 | 27 | 43 | 53 | 78 | 118 | 120 |
| 14-7.2 | 7 | 25 | 42 | 53 | 78 | 118 | 120 |
| 14-7.3 | 7 | 11 | 29 | 53 | 94 | 102 | 120 |
| 14-7.4 | 7 | 25 | 42 | 53 | 78 | 83 | 120 |
| 14-7.5 | 7 | 11 | 29 | 49 | 82 | 102 | 120 |
| 14-7.6a | 7 | 25 | 42 | 53 | 75 | 87 | 120 |
| 14-7.6b | 7 | 25 | 42 | 53 | 75 | 118 | 120 |
| 14-7.8a | 7 | 11 | 29 | 46 | 83 | 102 | 120 |
| 14-7.8b | 7 | 11 | 29 | 49 | 94 | 102 | 120 |
| 14-7.10a | 7 | 25 | 42 | 53 | 78 | 93 | 120 |
| 14-7.10b | 7 | 25 | 42 | 60 | 77 | 118 | 120 |
| 14-7.12 | 7 | 11 | 29 | 45 | 78 | 118 | 120 |
| 14-7.13 | 7 | 11 | 29 | 45 | 51 | 78 | 120 |
| 14-7.14 | 7 | 27 | 29 | 46 | 78 | 118 | 120 |
| 14-7.15 | 7 | 11 | 25 | 53 | 85 | 110 | 120 |
| 14-7.16 | 7 | 11 | 29 | 53 | 86 | 102 | 120 |
| 14-7.17a | 7 | 25 | 42 | 53 | 76 | 86 | 120 |
| 14-7.17b | 7 | 25 | 42 | 53 | 86 | 102 | 120 |
| 14-7.19a | 7 | 25 | 42 | 53 | 83 | 92 | 120 |
| 14-7.19b | 7 | 25 | 42 | 61 | 78 | 118 | 120 |
| 14-7.94 | 7 | 27 | 45 | 78 | 121 | 122 | 124 |
| 14-7.216 | 7 | 27 | 43 | 85 | 94 | 101 | 120 |

k = 15, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-8.1 | 7 32 52 | 1 | 63 | 21 | 0 | 0 | 0 | 0 | 0 | 99 | 63 | 2 | 2 | 11 | 1 | 26.3993 | 1 |
| 15-8.2 | 7 34 46 | 2 | 63 | 21 | 0 | 0 | 0 | 0 | 0 | 99 | 63 | 2 | 3 | 12 | 2 | 26.3999 | 2 |
| 15-8.3 | 7 38 44 | 3 | 69 | 15 | 2 | 0 | 0 | 0 | 0 | 101 | 69 | 3 | 1 | 3 | 13 | 26.4015 | 3 |
| 15-8.4 | 8 31 50 | 4 | 57 | 24 | 0 | 0 | 0 | 0 | 0 | 96 | 57 | 2 | 28 | 73 | 3 | 26.4028 | 4 |
| 15-8.5 | 8 32 44 | 5 | 57 | 24 | 0 | 0 | 0 | 0 | 0 | 96 | 57 | 2 | 29 | 74 | 4 | 26.4030 | 5 |
| 15-8.6 | 8 32 49 | 6 | 63 | 18 | 2 | 0 | 0 | 0 | 0 | 98 | 63 | 3 | 8 | 13 | 14 | 26.4032 | 6 |
| 15-8.7 | 8 32 49 | 6 | 57 | 24 | 0 | 0 | 0 | 0 | 0 | 96 | 57 | 2 | 30 | 75 | 5 | 26.4032 | 7 |
| 15-8.8 | 8 33 44 | 8 | 60 | 21 | 1 | 0 | 0 | 0 | 0 | 97 | 60 | 3 | 13 | 28 | 15 | 26.4034 | 8 |
| 15-8.9 | 8 33 44 | 9 | 66 | 15 | 3 | 0 | 0 | 0 | 0 | 99 | 66 | 3 | 4 | 4 | 16 | 26.4034 | 8 |
| 15-8.10 | 8 33 44 | 9 | 60 | 21 | 1 | 0 | 0 | 0 | 0 | 97 | 60 | 3 | 14 | 29 | 17 | 26.4034 | 8 |
| 15-8.11 | 8 33 44 | 11 | 60 | 21 | 1 | 0 | 0 | 0 | 0 | 97 | 60 | 3 | 15 | 30 | 18 | 26.4034 | 8 |
| 15-8.12 | 8 33 44 | 11 | 57 | 24 | 0 | 0 | 0 | 0 | 0 | 96 | 57 | 2 | 31 | 76 | 6 | 26.4034 | 8 |
| 15-8.13 | 8 34 42 | 13 | 63 | 18 | 2 | 0 | 0 | 0 | 0 | 98 | 63 | 3 | 9 | 14 | 19 | 26.4037 | 13 |
| 15-8.14a | 8 34 42 | 13 | 60 | 21 | 1 | 0 | 0 | 0 | 0 | 97 | 60 | 3 | 16 | 31 | 20 | 26.4037 | 13 |
| 15-8.14b | 8 34 42 | 13 | 60 | 21 | 1 | 0 | 0 | 0 | 0 | 97 | 60 | 3 | 16 | 31 | 20 | 26.4037 | 13 |
| 15-8.14c | 8 34 42 | 13 | 60 | 21 | 1 | 0 | 0 | 0 | 0 | 97 | 60 | 3 | 16 | 31 | 20 | 26.4037 | 13 |
| 15-8.17 | 8 34 43 | 17 | 60 | 21 | 1 | 0 | 0 | 0 | 0 | 97 | 60 | 3 | 19 | 34 | 23 | 26.4038 | 17 |
| 15-8.18 | 8 34 43 | 18 | 66 | 15 | 3 | 0 | 0 | 0 | 0 | 99 | 66 | 3 | 5 | 5 | 24 | 26.4038 | 17 |
| 15-8.19 | 8 34 46 | 19 | 60 | 21 | 1 | 0 | 0 | 0 | 0 | 97 | 60 | 3 | 20 | 34 | 25 | 26.4039 | 19 |
| 15-8.20 | 8 35 42 | 20 | 66 | 15 | 3 | 0 | 0 | 0 | 0 | 99 | 66 | 3 | 6 | 6 | 26 | 26.4041 | 20 |

k = 15, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-8.3 | 7 38 44 | 3 | 69 15 2 0 0 0 0 | 101 | 69 | 3 | 1 | 3 | 13 | 26.4015 | 3 |
| 15-8.1 | 7 32 52 | 1 | 63 21 0 0 0 0 0 | 99 | 63 | 2 | 2 | 11 | 1 | 26.3993 | 1 |
| 15-8.2 | 7 34 46 | 2 | 63 21 0 0 0 0 0 | 99 | 63 | 2 | 3 | 12 | 2 | 26.3999 | 2 |
| 15-8.9 | 8 33 44 | 9 | 66 15 3 0 0 0 0 | 99 | 66 | 3 | 4 | 4 | 16 | 26.4034 | 8 |
| 15-8.18 | 8 34 43 | 18 | 66 15 3 0 0 0 0 | 99 | 66 | 3 | 5 | 5 | 24 | 26.4038 | 17 |
| 15-8.20 | 8 35 42 | 20 | 66 15 3 0 0 0 0 | 99 | 66 | 3 | 6 | 6 | 26 | 26.4041 | 20 |
| 15-8.1221 | 14 28 28 | 1221 | 77 0 0 7 0 0 0 | 99 | 77 | 4 | 7 | 1 | 1366 | 26.4245 | 1226 |
| 15-8.6 | 8 32 49 | 6 | 63 18 2 0 0 0 0 | 98 | 63 | 3 | 8 | 13 | 14 | 26.4032 | 6 |
| 15-8.13 | 8 34 42 | 13 | 63 18 2 0 0 0 0 | 98 | 63 | 3 | 9 | 14 | 19 | 26.4037 | 13 |
| 15-8.22b | 8 36 41 | 22 | 63 18 2 0 0 0 0 | 98 | 63 | 3 | 10 | 16 | 28 | 26.4045 | 22 |

k = 15, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-8.1221 | 14 28 28 | 1221 | 77 0 0 7 0 0 0 | 99 | 77 | 4 | 7 | 1 | 1366 | 26.4245 | 1226 |
| 15-8.1578 | 15 28 24 | 1578 | 71 3 0 7 0 0 0 | 96 | 71 | 4 | 57 | 2 | 1615 | 26.4284 | 1593 |
| 15-8.3 | 7 38 44 | 3 | 69 15 2 0 0 0 0 | 101 | 69 | 3 | 1 | 3 | 13 | 26.4015 | 3 |
| 15-8.9 | 8 33 44 | 9 | 66 15 3 0 0 0 0 | 99 | 66 | 3 | 4 | 4 | 16 | 26.4034 | 8 |
| 15-8.18 | 8 34 43 | 18 | 66 15 3 0 0 0 0 | 99 | 66 | 3 | 5 | 5 | 24 | 26.4038 | 17 |
| 15-8.20 | 8 35 42 | 20 | 66 15 3 0 0 0 0 | 99 | 66 | 3 | 6 | 6 | 26 | 26.4041 | 20 |
| 15-8.152 | 10 32 37 | 152 | 66 9 7 0 0 0 0 | 97 | 66 | 3 | 27 | 7 | 148 | 26.4106 | 153 |
| 15-8.303 | 11 30 36 | 303 | 65 9 6 1 0 0 0 | 96 | 65 | 4 | 53 | 8 | 933 | 26.4137 | 303 |
| 15-8.344 | 11 31 34 | 344 | 65 9 6 1 0 0 0 | 96 | 65 | 4 | 55 | 9 | 940 | 26.4141 | 352 |
| 15-8.358 | 11 32 34 | 358 | 65 9 6 1 0 0 0 | 96 | 65 | 4 | 56 | 10 | 944 | 26.4145 | 363 |

k = 15, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-8.1 | 7 32 52 | 1 | 63 | 21 | 0 | 0 | 0 | 0 | 0 | 99 | 63 | 2 | 2 | 11 | 1 | 26.3993 | 1 |
| 15-8.2 | 7 34 46 | 2 | 63 | 21 | 0 | 0 | 0 | 0 | 0 | 99 | 63 | 2 | 3 | 12 | 2 | 26.3999 | 2 |
| 15-8.4 | 8 31 50 | 4 | 57 | 24 | 0 | 0 | 0 | 0 | 0 | 96 | 57 | 2 | 28 | 73 | 3 | 26.4028 | 4 |
| 15-8.5 | 8 32 44 | 5 | 57 | 24 | 0 | 0 | 0 | 0 | 0 | 96 | 57 | 2 | 29 | 74 | 4 | 26.4030 | 5 |
| 15-8.7 | 8 32 49 | 6 | 57 | 24 | 0 | 0 | 0 | 0 | 0 | 96 | 57 | 2 | 30 | 75 | 5 | 26.4032 | 7 |
| 15-8.12 | 8 33 44 | 11 | 57 | 24 | 0 | 0 | 0 | 0 | 0 | 96 | 57 | 2 | 31 | 76 | 6 | 26.4034 | 8 |
| 15-8.26 | 9 28 48 | 26 | 51 | 27 | 0 | 0 | 0 | 0 | 0 | 93 | 51 | 2 | 144 | 357 | 7 | 26.4054 | 25 |
| 15-8.31 | 9 30 46 | 27 | 51 | 27 | 0 | 0 | 0 | 0 | 0 | 93 | 51 | 2 | 145 | 358 | 8 | 26.4062 | 30 |
| 15-8.45 | 9 32 42 | 41 | 51 | 27 | 0 | 0 | 0 | 0 | 0 | 93 | 51 | 2 | 146 | 359 | 9 | 26.4069 | 41 |
| 15-8.214 | 11 20 60 | 214 | 39 | 33 | 0 | 0 | 0 | 0 | 0 | 87 | 39 | 2 | 831 | 1742 | 10 | 26.4104 | 149 |

k = 15, Design generators

| Design | Design Generators | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 15-8.1 | 7 | 25 | 42 | 53 | 78 | 83 | 111 | 120 |
| 15-8.2 | 7 | 25 | 42 | 53 | 75 | 87 | 116 | 120 |
| 15-8.3 | 7 | 11 | 29 | 45 | 51 | 78 | 118 | 120 |
| 15-8.4 | 7 | 25 | 42 | 53 | 62 | 78 | 83 | 120 |
| 15-8.5 | 7 | 25 | 42 | 53 | 75 | 87 | 108 | 120 |
| 15-8.6 | 7 | 11 | 29 | 46 | 53 | 83 | 107 | 120 |
| 15-8.7 | 7 | 25 | 42 | 53 | 62 | 78 | 92 | 120 |
| 15-8.8 | 7 | 11 | 29 | 45 | 62 | 81 | 98 | 120 |
| 15-8.9 | 7 | 11 | 25 | 45 | 50 | 86 | 110 | 120 |
| 15-8.10 | 7 | 11 | 29 | 46 | 49 | 82 | 102 | 120 |
| 15-8.11 | 7 | 11 | 29 | 46 | 49 | 82 | 109 | 120 |
| 15-8.12 | 7 | 25 | 42 | 52 | 63 | 77 | 91 | 120 |
| 15-8.13 | 7 | 11 | 25 | 45 | 55 | 86 | 100 | 120 |
| 15-8.14a | 7 | 11 | 29 | 45 | 62 | 81 | 99 | 120 |
| 15-8.14b | 7 | 11 | 29 | 46 | 49 | 83 | 102 | 120 |
| 15-8.14c | 7 | 11 | 29 | 46 | 49 | 83 | 109 | 120 |
| 15-8.17 | 7 | 11 | 29 | 45 | 62 | 81 | 106 | 120 |
| 15-8.18 | 7 | 11 | 25 | 42 | 53 | 78 | 118 | 120 |
| 15-8.19 | 7 | 11 | 29 | 46 | 53 | 83 | 94 | 120 |
| 15-8.20 | 7 | 11 | 25 | 45 | 49 | 86 | 110 | 120 |
| 15-8.22b | 7 | 11 | 29 | 45 | 51 | 78 | 86 | 120 |
| 15-8.26 | 7 | 25 | 42 | 52 | 77 | 86 | 107 | 120 |
| 15-8.31 | 7 | 25 | 42 | 52 | 63 | 77 | 86 | 120 |
| 15-8.45 | 7 | 25 | 42 | 52 | 63 | 77 | 107 | 120 |
| 15-8.152 | 7 | 11 | 13 | 30 | 49 | 82 | 101 | 120 |
| 15-8.214 | 7 | 25 | 42 | 52 | 77 | 86 | 119 | 120 |
| 15-8.303 | 7 | 11 | 19 | 25 | 45 | 77 | 118 | 120 |
| 15-8.344 | 7 | 11 | 19 | 25 | 45 | 86 | 100 | 120 |
| 15-8.358 | 7 | 11 | 19 | 25 | 45 | 77 | 110 | 120 |
| 15-8.1221 | 7 | 27 | 45 | 78 | 121 | 122 | 124 | 127 |
| 15-8.1578 | 7 | 27 | 43 | 85 | 94 | 101 | 110 | 120 |

k = 16, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-9.1 | 10 48 72 | 1 | 60 | 30 | 0 | 0 | 0 | 0 | 0 | 106 | 60 | 2 | 2 | 24 | 1 | 23.7778 | 1 |
| 16-9.2 | 11 44 82 | 2 | 54 | 33 | 0 | 0 | 0 | 0 | 0 | 103 | 54 | 2 | 24 | 238 | 2 | 23.7802 | 2 |
| 16-9.3 | 11 47 72 | 3 | 57 | 30 | 1 | 0 | 0 | 0 | 0 | 104 | 57 | 3 | 12 | 102 | 6 | 23.7810 | 3 |
| 16-9.4 | 11 48 70 | 4 | 57 | 30 | 1 | 0 | 0 | 0 | 0 | 104 | 57 | 3 | 13 | 103 | 7 | 23.7813 | 4 |
| 16-9.5 | 11 50 66 | 5 | 60 | 27 | 2 | 0 | 0 | 0 | 0 | 105 | 60 | 3 | 3 | 25 | 8 | 23.7819 | 5 |
| 16-9.6 | 11 50 68 | 6 | 60 | 27 | 2 | 0 | 0 | 0 | 0 | 105 | 60 | 3 | 4 | 26 | 9 | 23.7819 | 6 |
| 16-9.7 | 11 52 66 | 7 | 60 | 27 | 2 | 0 | 0 | 0 | 0 | 105 | 60 | 3 | 5 | 27 | 10 | 23.7826 | 8 |
| 16-9.8 | 11 56 66 | 8 | 66 | 21 | 4 | 0 | 0 | 0 | 0 | 107 | 66 | 3 | 1 | 6 | 11 | 23.7842 | 16 |
| 16-9.9 | 12 40 80 | 9 | 48 | 36 | 0 | 0 | 0 | 0 | 0 | 100 | 48 | 2 | 168 | 968 | 3 | 23.7822 | 7 |
| 16-9.10 | 12 46 68 | 10 | 60 | 24 | 4 | 0 | 0 | 0 | 0 | 104 | 60 | 3 | 14 | 28 | 12 | 23.7840 | 9 |
| 16-9.11 | 12 46 68 | 10 | 57 | 27 | 3 | 0 | 0 | 0 | 0 | 103 | 57 | 3 | 25 | 104 | 13 | 23.7840 | 9 |
| 16-9.12a | 12 46 68 | 10 | 54 | 30 | 2 | 0 | 0 | 0 | 0 | 102 | 54 | 3 | 50 | 239 | 14 | 23.7840 | 9 |
| 16-9.12b | 12 46 68 | 10 | 54 | 30 | 2 | 0 | 0 | 0 | 0 | 102 | 54 | 3 | 50 | 239 | 14 | 23.7840 | 9 |
| 16-9.14a | 12 46 69 | 14 | 54 | 30 | 2 | 0 | 0 | 0 | 0 | 102 | 54 | 3 | 52 | 241 | 16 | 23.7840 | 13 |
| 16-9.14b | 12 46 69 | 14 | 54 | 30 | 2 | 0 | 0 | 0 | 0 | 102 | 54 | 3 | 52 | 241 | 16 | 23.7840 | 13 |
| 16-9.16 | 12 46 69 | 14 | 51 | 33 | 1 | 0 | 0 | 0 | 0 | 101 | 51 | 3 | 102 | 535 | 18 | 23.7840 | 13 |
| 16-9.17a | 12 47 66 | 17 | 60 | 24 | 4 | 0 | 0 | 0 | 0 | 104 | 60 | 3 | 15 | 29 | 19 | 23.7843 | 17 |
| 16-9.17b | 12 47 66 | 17 | 60 | 24 | 4 | 0 | 0 | 0 | 0 | 104 | 60 | 3 | 15 | 29 | 19 | 23.7843 | 17 |
| 16-9.19a | 12 47 66 | 17 | 57 | 27 | 3 | 0 | 0 | 0 | 0 | 103 | 57 | 3 | 26 | 105 | 21 | 23.7843 | 17 |
| 16-9.19b | 12 47 66 | 17 | 57 | 27 | 3 | 0 | 0 | 0 | 0 | 103 | 57 | 3 | 26 | 105 | 21 | 23.7843 | 17 |

k = 16, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-9.8 | 11 56 66 | 8 | 66 | 21 | 4 | 0 | 0 | 0 | 0 | 0 | 107 | 66 | 3 | 1 | 6 | 11 | 23.7842 | 16 |
| 16-9.1 | 10 48 72 | 1 | 60 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 106 | 60 | 2 | 2 | 24 | 1 | 23.7778 | 1 |
| 16-9.5 | 11 50 66 | 5 | 60 | 27 | 2 | 0 | 0 | 0 | 0 | 0 | 105 | 60 | 3 | 3 | 25 | 8 | 23.7819 | 5 |
| 16-9.6 | 11 50 68 | 6 | 60 | 27 | 2 | 0 | 0 | 0 | 0 | 0 | 105 | 60 | 3 | 4 | 26 | 9 | 23.7819 | 6 |
| 16-9.7 | 11 52 66 | 7 | 60 | 27 | 2 | 0 | 0 | 0 | 0 | 0 | 105 | 60 | 3 | 5 | 27 | 10 | 23.7826 | 8 |
| 16-9.35 | 12 50 63 | 35 | 63 | 21 | 5 | 0 | 0 | 0 | 0 | 0 | 105 | 63 | 3 | 6 | 11 | 37 | 23.7854 | 37 |
| 16-9.39 | 12 52 63 | 39 | 63 | 21 | 5 | 0 | 0 | 0 | 0 | 0 | 105 | 63 | 3 | 7 | 12 | 41 | 23.7861 | 40 |
| 16-9.80 | 13 46 66 | 80 | 65 | 18 | 5 | 1 | 0 | 0 | 0 | 0 | 105 | 65 | 4 | 8 | 7 | 803 | 23.7875 | 80 |
| 16-9.90 | 13 47 64 | 90 | 65 | 18 | 5 | 1 | 0 | 0 | 0 | 0 | 105 | 65 | 4 | 9 | 8 | 806 | 23.7878 | 91 |

k = 16, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-9.1413 | 17 43 56 | 1413 | 69 | 6 | 9 | 3 | 0 | 0 | 0 | 0 | 103 | 69 | 4 | 46 | 1 | 1551 | 23.8004 | 1446 |
| 16-9.2469 | 19 40 50 | 2469 | 69 | 11 | 0 | 6 | 1 | 0 | 0 | 0 | 103 | 69 | 5 | 47 | 2 | 4905 | 23.8062 | 2578 |
| 16-9.2499 | 19 41 48 | 2499 | 69 | 11 | 0 | 6 | 1 | 0 | 0 | 0 | 103 | 69 | 5 | 48 | 3 | 4911 | 23.8065 | 2647 |
| 16-9.2531 | 19 42 48 | 2531 | 69 | 11 | 0 | 6 | 1 | 0 | 0 | 0 | 103 | 69 | 5 | 49 | 4 | 4917 | 23.8069 | 2696 |
| 16-9.225 | 14 46 61 | 225 | 67 | 15 | 5 | 2 | 0 | 0 | 0 | 0 | 105 | 67 | 4 | 11 | 5 | 842 | 23.7909 | 232 |
| 16-9.8 | 11 56 66 | 8 | 66 | 21 | 4 | 0 | 0 | 0 | 0 | 0 | 107 | 66 | 3 | 1 | 6 | 11 | 23.7842 | 16 |
| 16-9.80 | 13 46 66 | 80 | 65 | 18 | 5 | 1 | 0 | 0 | 0 | 0 | 105 | 65 | 4 | 8 | 7 | 803 | 23.7875 | 80 |
| 16-9.90 | 13 47 64 | 90 | 65 | 18 | 5 | 1 | 0 | 0 | 0 | 0 | 105 | 65 | 4 | 9 | 8 | 806 | 23.7878 | 91 |

k = 16, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-9.1 | 10 48 72 | 1 | 60 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 106 | 60 | 2 | 2 | 24 | 1 | 23.7778 | 1 |
| 16-9.2 | 11 44 82 | 2 | 54 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 103 | 54 | 2 | 24 | 238 | 2 | 23.7802 | 2 |
| 16-9.9 | 12 40 80 | 9 | 48 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 48 | 2 | 168 | 968 | 3 | 23.7822 | 7 |
| 16-9.287 | 15 30 100 | 287 | 30 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 91 | 30 | 2 | 2383 | 5641 | 4 | 23.7897 | 142 |
| 16-9.2604 | 20 0 160 | 2604 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 76 | 0 | 2 | 6195 | 7485 | 5 | 23.7982 | 1042 |
| 16-9.3 | 11 47 72 | 3 | 57 | 30 | 1 | 0 | 0 | 0 | 0 | 0 | 104 | 57 | 3 | 12 | 102 | 6 | 23.7810 | 3 |
| 16-9.4 | 11 48 70 | 4 | 57 | 30 | 1 | 0 | 0 | 0 | 0 | 0 | 104 | 57 | 3 | 13 | 103 | 7 | 23.7813 | 4 |
| 16-9.5 | 11 50 66 | 5 | 60 | 27 | 2 | 0 | 0 | 0 | 0 | 0 | 105 | 60 | 3 | 3 | 25 | 8 | 23.7819 | 5 |
| 16-9.6 | 11 50 68 | 6 | 60 | 27 | 2 | 0 | 0 | 0 | 0 | 0 | 105 | 60 | 3 | 4 | 26 | 9 | 23.7819 | 6 |
| 16-9.7 | 11 52 66 | 7 | 60 | 27 | 2 | 0 | 0 | 0 | 0 | 0 | 105 | 60 | 3 | 5 | 27 | 10 | 23.7826 | 8 |

k = 16, Design generators

| Design | Design Generators | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 16-9.1 | 7 | 120 | 25 | 42 | 53 | 75 | 87 | 108 | 118 |
| 16-9.2 | 7 | 120 | 25 | 42 | 53 | 62 | 78 | 83 | 92 |
| 16-9.3 | 7 | 120 | 11 | 29 | 45 | 51 | 78 | 81 | 111 |
| 16-9.4 | 7 | 120 | 11 | 29 | 45 | 51 | 78 | 81 | 100 |
| 16-9.5 | 7 | 120 | 11 | 29 | 45 | 51 | 78 | 81 | 107 |
| 16-9.6 | 7 | 120 | 11 | 29 | 45 | 51 | 78 | 81 | 118 |
| 16-9.7 | 7 | 120 | 11 | 29 | 45 | 51 | 62 | 78 | 81 |
| 16-9.8 | 7 | 120 | 11 | 29 | 45 | 51 | 53 | 78 | 118 |
| 16-9.9 | 7 | 120 | 25 | 42 | 52 | 77 | 86 | 107 | 119 |
| 16-9.10 | 7 | 120 | 11 | 21 | 46 | 54 | 89 | 95 | 99 |
| 16-9.11 | 7 | 120 | 11 | 21 | 41 | 51 | 78 | 86 | 100 |
| 16-9.12a | 7 | 120 | 11 | 29 | 45 | 49 | 78 | 86 | 106 |
| 16-9.12b | 7 | 120 | 11 | 21 | 45 | 62 | 86 | 91 | 97 |
| 16-9.14a | 7 | 120 | 11 | 29 | 45 | 53 | 78 | 81 | 98 |
| 16-9.14b | 7 | 120 | 11 | 25 | 45 | 51 | 78 | 90 | 101 |
| 16-9.16 | 7 | 120 | 11 | 29 | 45 | 51 | 78 | 81 | 106 |
| 16-9.17a | 7 | 120 | 11 | 21 | 45 | 86 | 91 | 97 | 103 |
| 16-9.17b | 7 | 120 | 11 | 25 | 45 | 49 | 77 | 82 | 110 |
| 16-9.19a | 7 | 120 | 11 | 21 | 41 | 51 | 78 | 93 | 100 |
| 16-9.19b | 7 | 120 | 11 | 21 | 41 | 58 | 77 | 91 | 118 |
| 16-9.35 | 7 | 120 | 11 | 25 | 45 | 50 | 60 | 86 | 110 |
| 16-9.39 | 7 | 120 | 11 | 25 | 45 | 49 | 63 | 86 | 110 |
| 16-9.80 | 7 | 120 | 11 | 19 | 29 | 41 | 44 | 94 | 102 |
| 16-9.90 | 7 | 120 | 11 | 19 | 41 | 44 | 53 | 78 | 118 |
| 16-9.225 | 7 | 120 | 11 | 19 | 25 | 41 | 53 | 78 | 118 |
| 16-9.287 | 7 | 120 | 25 | 42 | 61 | 77 | 83 | 95 | 99 |
| 16-9.1413 | 7 | 120 | 11 | 19 | 25 | 28 | 45 | 77 | 110 |
| 16-9.2469 | 7 | 120 | 11 | 19 | 25 | 26 | 45 | 77 | 118 |
| 16-9.2499 | 7 | 120 | 11 | 19 | 25 | 26 | 45 | 86 | 100 |
| 16-9.2531 | 7 | 120 | 11 | 19 | 25 | 26 | 45 | 77 | 110 |
| 16-9.2604 | 7 | 121 | 112 | 26 | 44 | 59 | 79 | 94 | 109 |

k = 17, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-10.1 | 15 60 130 | 1 | 46 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 108 | 46 | 2 | 53 | 1594 | 1 | 21.4231 | 1 |
| 17-10.2 | 15 66 110 | 2 | 52 | 39 | 2 | 0 | 0 | 0 | 0 | 0 | 110 | 52 | 3 | 6 | 390 | 3 | 21.4245 | 2 |
| 17-10.3 | 15 68 106 | 3 | 52 | 39 | 2 | 0 | 0 | 0 | 0 | 0 | 110 | 52 | 3 | 7 | 391 | 4 | 21.4251 | 3 |
| 17-10.4 | 15 72 102 | 4 | 58 | 33 | 4 | 0 | 0 | 0 | 0 | 0 | 112 | 58 | 3 | 1 | 62 | 5 | 21.4263 | 4 |
| 17-10.5 | 16 64 108 | 5 | 46 | 42 | 2 | 0 | 0 | 0 | 0 | 0 | 107 | 46 | 3 | 106 | 1594 | 6 | 21.4270 | 5 |
| 17-10.6 | 16 65 105 | 6 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 8 | 152 | 7 | 21.4273 | 6 |
| 17-10.7 | 16 65 105 | 6 | 52 | 36 | 4 | 0 | 0 | 0 | 0 | 0 | 109 | 52 | 3 | 22 | 392 | 8 | 21.4273 | 6 |
| 17-10.8 | 16 65 107 | 8 | 49 | 39 | 3 | 0 | 0 | 0 | 0 | 0 | 108 | 49 | 3 | 54 | 835 | 9 | 21.4273 | 8 |
| 17-10.9 | 16 66 102 | 9 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 9 | 153 | 10 | 21.4275 | 9 |
| 17-10.10 | 16 66 102 | 9 | 52 | 36 | 4 | 0 | 0 | 0 | 0 | 0 | 109 | 52 | 3 | 22 | 393 | 11 | 21.4275 | 9 |
| 17-10.11 | 16 67 101 | 11 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 10 | 154 | 12 | 21.4278 | 11 |
| 17-10.12 | 16 68 99 | 12 | 58 | 30 | 6 | 0 | 0 | 0 | 0 | 0 | 111 | 58 | 3 | 2 | 63 | 13 | 21.4281 | 12 |
| 17-10.13 | 16 68 100 | 13 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 11 | 155 | 14 | 21.4281 | 13 |
| 17-10.14 | 16 69 99 | 14 | 58 | 30 | 6 | 0 | 0 | 0 | 0 | 0 | 111 | 58 | 3 | 3 | 64 | 15 | 21.4284 | 14 |
| 17-10.15 | 16 69 99 | 14 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 12 | 156 | 16 | 21.4284 | 14 |
| 17-10.16 | 17 62 106 | 16 | 51 | 36 | 3 | 1 | 0 | 0 | 0 | 0 | 108 | 51 | 4 | 55 | 525 | 365 | 21.4295 | 16 |
| 17-10.17 | 17 62 108 | 17 | 49 | 36 | 5 | 0 | 0 | 0 | 0 | 0 | 107 | 49 | 3 | 107 | 836 | 17 | 21.4296 | 17 |
| 17-10.18 | 17 64 99 | 18 | 55 | 30 | 7 | 0 | 0 | 0 | 0 | 0 | 109 | 55 | 3 | 24 | 157 | 18 | 21.4300 | 18 |
| 17-10.19 | 17 64 100 | 19 | 51 | 36 | 3 | 1 | 0 | 0 | 0 | 0 | 108 | 51 | 4 | 56 | 526 | 366 | 21.4300 | 19 |
| 17-10.20 | 17 64 102 | 20 | 55 | 30 | 7 | 0 | 0 | 0 | 0 | 0 | 109 | 55 | 3 | 25 | 158 | 19 | 21.4301 | 20 |

k = 17, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-10.4 | 15 72 102 | 4 | 58 | 33 | 4 | 0 | 0 | 0 | 0 | 0 | 112 | 58 | 3 | 1 | 62 | 5 | 21.4263 | 4 |
| 17-10.12 | 16 68 99 | 12 | 58 | 30 | 6 | 0 | 0 | 0 | 0 | 0 | 111 | 58 | 3 | 2 | 63 | 13 | 21.4281 | 12 |
| 17-10.14 | 16 69 99 | 14 | 58 | 30 | 6 | 0 | 0 | 0 | 0 | 0 | 111 | 58 | 3 | 3 | 64 | 15 | 21.4284 | 14 |
| 17-10.1042 | 21 62 92 | 1042 | 68 | 14 | 9 | 2 | 1 | 0 | 0 | 0 | 111 | 68 | 5 | 4 | 4 | 6454 | 21.4419 | 1091 |
| 17-10.2453 | 23 60 86 | 2453 | 68 | 19 | 0 | 5 | 2 | 0 | 0 | 0 | 111 | 68 | 5 | 5 | 5 | 6685 | 21.4475 | 2680 |
| 17-10.2 | 15 66 110 | 2 | 52 | 39 | 2 | 0 | 0 | 0 | 0 | 0 | 110 | 52 | 3 | 6 | 390 | 3 | 21.4245 | 2 |
| 17-10.3 | 15 68 106 | 3 | 52 | 39 | 2 | 0 | 0 | 0 | 0 | 0 | 110 | 52 | 3 | 7 | 391 | 4 | 21.4251 | 3 |
| 17-10.6 | 16 65 105 | 6 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 8 | 152 | 7 | 21.4273 | 6 |
| 17-10.9 | 16 66 102 | 9 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 9 | 153 | 10 | 21.4275 | 9 |
| 17-10.11 | 16 67 101 | 11 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 10 | 154 | 12 | 21.4278 | 11 |

k = 17, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-10.5924 | 27 56 82 | 5924 | 75 | 3 | 8 | 4 | 3 | 0 | 0 | 0 | 110 | 75 | 5 | 21 | 1 | 7888 | 21.4589 | 6713 |
| 17-10.12633 | 39 44 86 | 12633 | 70 | 0 | 0 | 12 | 0 | 3 | 0 | 0 | 102 | 70 | 6 | 1412 | 2 | 13402 | 21.4938 | 13276 |
| 17-10.6792 | 28 55 77 | 6792 | 69 | 6 | 8 | 4 | 3 | 0 | 0 | 0 | 107 | 69 | 5 | 202 | 3 | 8264 | 21.4617 | 7580 |
| 17-10.1042 | 21 62 92 | 1042 | 68 | 14 | 9 | 2 | 1 | 0 | 0 | 0 | 111 | 68 | 5 | 4 | 4 | 6454 | 21.4419 | 1091 |
| 17-10.2453 | 23 60 86 | 2453 | 68 | 19 | 0 | 5 | 2 | 0 | 0 | 0 | 111 | 68 | 5 | 5 | 5 | 6685 | 21.4475 | 2680 |
| 17-10.6795a | 28 55 79 | 6795 | 66 | 6 | 6 | 10 | 0 | 0 | 0 | 0 | 105 | 66 | 4 | 516 | 6 | 4750 | 21.4617 | 7626 |
| 17-10.6795b | 28 55 79 | 6795 | 66 | 6 | 6 | 10 | 0 | 0 | 0 | 0 | 105 | 66 | 4 | 516 | 6 | 4750 | 21.4617 | 7626 |
| 17-10.7585a | 29 52 76 | 7585 | 66 | 6 | 9 | 4 | 3 | 0 | 0 | 0 | 105 | 66 | 5 | 518 | 8 | 8654 | 21.4638 | 8165 |
| 17-10.7585b | 29 52 76 | 7585 | 66 | 6 | 9 | 4 | 3 | 0 | 0 | 0 | 105 | 66 | 5 | 518 | 8 | 8653 | 21.4638 | 8165 |

k = 17, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-10.1 | 15 60 130 | 1 | 46 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 108 | 46 | 2 | 53 | 1594 | 1 | 21.4231 | 1 |
| 17-10.315 | 20 40 160 | 315 | 16 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 93 | 16 | 2 | 6299 | 12479 | 2 | 21.4333 | 105 |
| 17-10.2 | 15 66 110 | 2 | 52 | 39 | 2 | 0 | 0 | 0 | 0 | 0 | 110 | 52 | 3 | 6 | 390 | 3 | 21.4245 | 2 |
| 17-10.3 | 15 68 106 | 3 | 52 | 39 | 2 | 0 | 0 | 0 | 0 | 0 | 110 | 52 | 3 | 7 | 391 | 4 | 21.4251 | 3 |
| 17-10.4 | 15 72 102 | 4 | 58 | 33 | 4 | 0 | 0 | 0 | 0 | 0 | 112 | 58 | 3 | 1 | 62 | 5 | 21.4263 | 4 |
| 17-10.5 | 16 64 108 | 5 | 46 | 42 | 2 | 0 | 0 | 0 | 0 | 0 | 107 | 46 | 3 | 106 | 1594 | 6 | 21.4270 | 5 |
| 17-10.6 | 16 65 105 | 6 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 8 | 152 | 7 | 21.4273 | 6 |
| 17-10.7 | 16 65 105 | 6 | 52 | 36 | 4 | 0 | 0 | 0 | 0 | 0 | 109 | 52 | 3 | 22 | 392 | 8 | 21.4273 | 6 |
| 17-10.8 | 16 65 107 | 8 | 49 | 39 | 3 | 0 | 0 | 0 | 0 | 0 | 108 | 49 | 3 | 54 | 835 | 9 | 21.4273 | 8 |
| 17-10.9 | 16 66 102 | 9 | 55 | 33 | 5 | 0 | 0 | 0 | 0 | 0 | 110 | 55 | 3 | 9 | 153 | 10 | 21.4275 | 9 |

k = 17, Design generators

| Design | Design Generators | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 17-10.1 | 7 | 25 | 42 | 53 | 62 | 78 | 83 | 92 | 99 | 120 |
| 17-10.2 | 7 | 11 | 29 | 45 | 51 | 78 | 81 | 100 | 118 | 120 |
| 17-10.3 | 7 | 11 | 29 | 45 | 51 | 62 | 78 | 81 | 100 | 120 |
| 17-10.4 | 7 | 11 | 25 | 45 | 51 | 62 | 78 | 84 | 90 | 120 |
| 17-10.5 | 7 | 11 | 29 | 45 | 51 | 78 | 81 | 106 | 118 | 120 |
| 17-10.6 | 7 | 11 | 21 | 45 | 62 | 86 | 91 | 97 | 103 | 120 |
| 17-10.7 | 7 | 11 | 21 | 41 | 58 | 77 | 91 | 110 | 118 | 120 |
| 17-10.8 | 7 | 11 | 25 | 45 | 51 | 62 | 78 | 84 | 101 | 120 |
| 17-10.9 | 7 | 11 | 21 | 38 | 57 | 76 | 83 | 111 | 118 | 120 |
| 17-10.10 | 7 | 11 | 25 | 45 | 51 | 77 | 87 | 98 | 118 | 120 |
| 17-10.11 | 7 | 11 | 21 | 41 | 51 | 63 | 78 | 93 | 100 | 120 |
| 17-10.12 | 7 | 11 | 21 | 45 | 59 | 78 | 86 | 97 | 103 | 120 |
| 17-10.13 | 7 | 11 | 21 | 38 | 57 | 77 | 83 | 110 | 118 | 120 |
| 17-10.14 | 7 | 11 | 21 | 45 | 54 | 83 | 93 | 97 | 103 | 120 |
| 17-10.15 | 7 | 11 | 21 | 45 | 51 | 62 | 78 | 86 | 97 | 120 |
| 17-10.16 | 7 | 11 | 19 | 41 | 53 | 74 | 85 | 110 | 118 | 120 |
| 17-10.17 | 7 | 11 | 21 | 41 | 54 | 58 | 79 | 86 | 101 | 120 |
| 17-10.18 | 7 | 11 | 21 | 38 | 57 | 73 | 83 | 108 | 118 | 120 |
| 17-10.19 | 7 | 11 | 19 | 41 | 53 | 78 | 82 | 109 | 118 | 120 |
| 17-10.20 | 7 | 11 | 21 | 41 | 50 | 63 | 78 | 84 | 101 | 120 |
| 17-10.315 | 7 | 25 | 42 | 61 | 77 | 83 | 95 | 99 | 108 | 120 |
| 17-10.1042 | 7 | 11 | 19 | 25 | 28 | 35 | 45 | 86 | 110 | 120 |
| 17-10.2453 | 7 | 11 | 19 | 25 | 26 | 41 | 53 | 78 | 118 | 120 |
| 17-10.5924 | 7 | 11 | 19 | 25 | 26 | 28 | 45 | 77 | 110 | 120 |
| 17-10.6792 | 7 | 11 | 13 | 19 | 25 | 26 | 46 | 85 | 100 | 120 |
| 17-10.6795a | 7 | 11 | 13 | 19 | 21 | 25 | 46 | 78 | 98 | 120 |
| 17-10.6795b | 7 | 11 | 13 | 19 | 21 | 25 | 46 | 78 | 118 | 120 |
| 17-10.7585a | 7 | 11 | 13 | 19 | 25 | 26 | 53 | 85 | 110 | 120 |
| 17-10.7585b | 7 | 11 | 13 | 19 | 25 | 26 | 54 | 86 | 110 | 120 |
| 17-10.7644a | 7 | 11 | 13 | 19 | 25 | 26 | 46 | 78 | 118 | 120 |
| 17-10.12633 | 7 | 11 | 19 | 25 | 26 | 28 | 31 | 45 | 78 | 120 |

k = 18, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-11.1 | 20 80 200 | 1 | 33 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 111 | 33 | 2 | 209 | 10601 | 1 | 19.3048 | 1 |
| 18-11.2 | 20 92 160 | 2 | 45 | 48 | 4 | 0 | 0 | 0 | 0 | 0 | 115 | 45 | 3 | 7 | 1464 | 2 | 19.3074 | 2 |
| 18-11.3 | 21 95 148 | 3 | 54 | 36 | 9 | 0 | 0 | 0 | 0 | 0 | 117 | 54 | 3 | 1 | 124 | 3 | 19.3109 | 3 |
| 18-11.4 | 21 96 151 | 4 | 54 | 36 | 9 | 0 | 0 | 0 | 0 | 0 | 117 | 54 | 3 | 2 | 125 | 4 | 19.3112 | 4 |
| 18-11.5 | 22 86 162 | 5 | 42 | 45 | 7 | 0 | 0 | 0 | 0 | 0 | 112 | 42 | 3 | 91 | 2702 | 5 | 19.3114 | 5 |
| 18-11.6 | 22 90 150 | 6 | 51 | 36 | 10 | 0 | 0 | 0 | 0 | 0 | 115 | 51 | 3 | 8 | 260 | 6 | 19.3123 | 6 |
| 18-11.7 | 22 90 150 | 6 | 48 | 39 | 9 | 0 | 0 | 0 | 0 | 0 | 114 | 48 | 3 | 24 | 693 | 7 | 19.3123 | 6 |
| 18-11.8 | 22 92 146 | 8 | 51 | 36 | 10 | 0 | 0 | 0 | 0 | 0 | 115 | 51 | 3 | 9 | 261 | 8 | 19.3128 | 10 |
| 18-11.9 | 22 92 146 | 8 | 50 | 39 | 7 | 1 | 0 | 0 | 0 | 0 | 115 | 50 | 4 | 10 | 363 | 69 | 19.3128 | 10 |
| 18-11.10a | 22 92 146 | 10 | 53 | 36 | 8 | 1 | 0 | 0 | 0 | 0 | 116 | 53 | 4 | 5 | 155 | 70 | 19.3128 | 8 |
| 18-11.10b | 22 92 146 | 10 | 53 | 36 | 8 | 1 | 0 | 0 | 0 | 0 | 116 | 53 | 4 | 5 | 155 | 70 | 19.3128 | 8 |
| 18-11.12a | 22 92 148 | 12 | 50 | 39 | 7 | 1 | 0 | 0 | 0 | 0 | 115 | 50 | 4 | 11 | 364 | 72 | 19.3128 | 12 |
| 18-11.12b | 22 92 148 | 12 | 50 | 39 | 7 | 1 | 0 | 0 | 0 | 0 | 115 | 50 | 4 | 11 | 364 | 72 | 19.3128 | 12 |
| 18-11.14 | 23 86 154 | 14 | 48 | 36 | 11 | 0 | 0 | 0 | 0 | 0 | 113 | 48 | 3 | 51 | 694 | 9 | 19.3141 | 14 |
| 18-11.15 | 23 86 154 | 14 | 44 | 42 | 7 | 1 | 0 | 0 | 0 | 0 | 112 | 44 | 4 | 92 | 1836 | 74 | 19.3141 | 14 |
| 18-11.16 | 23 88 148 | 16 | 50 | 36 | 9 | 1 | 0 | 0 | 0 | 0 | 114 | 50 | 4 | 25 | 366 | 75 | 19.3145 | 16 |
| 18-11.17 | 23 88 148 | 16 | 48 | 36 | 11 | 0 | 0 | 0 | 0 | 0 | 113 | 48 | 3 | 53 | 695 | 10 | 19.3145 | 16 |
| 18-11.18 | 23 88 148 | 16 | 47 | 39 | 8 | 1 | 0 | 0 | 0 | 0 | 113 | 47 | 4 | 53 | 951 | 76 | 19.3145 | 16 |
| 18-11.19 | 23 88 148 | 16 | 43 | 45 | 4 | 2 | 0 | 0 | 0 | 0 | 112 | 43 | 4 | 93 | 2259 | 77 | 19.3145 | 19 |
| 18-11.20 | 23 88 150 | 20 | 51 | 33 | 12 | 0 | 0 | 0 | 0 | 0 | 114 | 51 | 3 | 26 | 262 | 11 | 19.3146 | 20 |

k = 18, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-11.3 | 21 95 148 | 3 | 54 | 36 | 9 | 0 | 0 | 0 | 0 | 0 | 117 | 54 | 3 | 1 | 124 | 3 | 19.3109 | 3 |
| 18-11.4 | 21 96 151 | 4 | 54 | 36 | 9 | 0 | 0 | 0 | 0 | 0 | 117 | 54 | 3 | 2 | 125 | 4 | 19.3112 | 4 |
| 18-11.5146 | 32 80 132 | 5146 | 71 | 13 | 8 | 4 | 2 | 1 | 0 | 0 | 117 | 71 | 6 | 3 | 5 | 18580 | 19.3377 | 6205 |
| 18-11.14398 | 40 72 124 | 14398 | 81 | 3 | 0 | 12 | 0 | 3 | 0 | 0 | 117 | 81 | 6 | 4 | 1 | 20088 | 19.3583 | 16763 |
| 18-11.10b | 22 92 146 | 10 | 53 | 36 | 8 | 1 | 0 | 0 | 0 | 0 | 116 | 53 | 4 | 5 | 155 | 70 | 19.3128 | 8 |
| 18-11.10a | 22 92 146 | 10 | 53 | 36 | 8 | 1 | 0 | 0 | 0 | 0 | 116 | 53 | 4 | 5 | 155 | 70 | 19.3128 | 8 |
| 18-11.2 | 20 92 160 | 2 | 45 | 48 | 4 | 0 | 0 | 0 | 0 | 0 | 115 | 45 | 3 | 7 | 1464 | 2 | 19.3074 | 2 |
| 18-11.6 | 22 90 150 | 6 | 51 | 36 | 10 | 0 | 0 | 0 | 0 | 0 | 115 | 51 | 3 | 8 | 260 | 6 | 19.3123 | 6 |
| 18-11.8 | 22 92 146 | 8 | 51 | 36 | 10 | 0 | 0 | 0 | 0 | 0 | 115 | 51 | 3 | 9 | 261 | 8 | 19.3128 | 10 |
| 18-11.9 | 22 92 146 | 8 | 50 | 39 | 7 | 1 | 0 | 0 | 0 | 0 | 115 | 50 | 4 | 10 | 363 | 69 | 19.3128 | 10 |

k = 18, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-11.14398 | 40 72 124 | 14398 | 81 | 3 | 0 | 12 | 0 | 3 | 0 | 0 | 117 | 81 | 6 | 4 | 1 | 20088 | 19.3583 | 16763 |
| 18-11.15397a | 41 71 120 | 15397 | 72 | 6 | 1 | 9 | 6 | 0 | 0 | 0 | 112 | 72 | 5 | 206 | 2 | 13773 | 19.3608 | 17757 |
| 18-11.15397b | 41 71 120 | 15397 | 72 | 6 | 1 | 9 | 6 | 0 | 0 | 0 | 112 | 72 | 5 | 206 | 2 | 13773 | 19.3608 | 17757 |
| 18-11.16125 | 42 72 112 | 16125 | 72 | 6 | 1 | 12 | 0 | 3 | 0 | 0 | 112 | 72 | 6 | 208 | 4 | 20598 | 19.3637 | 18906 |
| 18-11.5146 | 32 80 132 | 5146 | 71 | 13 | 8 | 4 | 2 | 1 | 0 | 0 | 117 | 71 | 6 | 3 | 5 | 18580 | 19.3377 | 6205 |
| 18-11.15386 | 41 70 120 | 15386 | 69 | 9 | 0 | 9 | 6 | 0 | 0 | 0 | 111 | 69 | 5 | 372 | 6 | 13769 | 19.3605 | 17304 |
| 18-11.23841a | 56 56 140 | 23841 | 69 | 3 | 0 | 0 | 12 | 3 | 0 | 0 | 105 | 69 | 6 | 3057 | 7 | 23076 | 19.4004 | 24353 |
| 18-11.23841b | 56 56 140 | 23841 | 69 | 3 | 0 | 0 | 12 | 3 | 0 | 0 | 105 | 69 | 6 | 3057 | 7 | 23076 | 19.4004 | 24352 |
| 18-11.5147 | 32 80 132 | 5146 | 66 | 14 | 6 | 9 | 1 | 0 | 0 | 0 | 114 | 66 | 5 | 48 | 9 | 7496 | 19.3377 | 6205 |
| 18-11.6397 | 33 79 128 | 6397 | 66 | 14 | 9 | 3 | 4 | 0 | 0 | 0 | 114 | 66 | 5 | 50 | 10 | 8258 | 19.3402 | 7583 |

k = 18, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-11.1 | 20 80 200 | 1 | 33 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 111 | 33 | 2 | 209 | 10601 | 1 | 19.3048 | 1 |
| 18-11.2 | 20 92 160 | 2 | 45 | 48 | 4 | 0 | 0 | 0 | 0 | 0 | 115 | 45 | 3 | 7 | 1464 | 2 | 19.3074 | 2 |
| 18-11.3 | 21 95 148 | 3 | 54 | 36 | 9 | 0 | 0 | 0 | 0 | 0 | 117 | 54 | 3 | 1 | 124 | 3 | 19.3109 | 3 |
| 18-11.4 | 21 96 151 | 4 | 54 | 36 | 9 | 0 | 0 | 0 | 0 | 0 | 117 | 54 | 3 | 2 | 125 | 4 | 19.3112 | 4 |
| 18-11.5 | 22 86 162 | 5 | 42 | 45 | 7 | 0 | 0 | 0 | 0 | 0 | 112 | 42 | 3 | 91 | 2702 | 5 | 19.3114 | 5 |
| 18-11.6 | 22 90 150 | 6 | 51 | 36 | 10 | 0 | 0 | 0 | 0 | 0 | 115 | 51 | 3 | 8 | 260 | 6 | 19.3123 | 6 |
| 18-11.7 | 22 90 150 | 6 | 48 | 39 | 9 | 0 | 0 | 0 | 0 | 0 | 114 | 48 | 3 | 24 | 693 | 7 | 19.3123 | 6 |
| 18-11.8 | 22 92 146 | 8 | 51 | 36 | 10 | 0 | 0 | 0 | 0 | 0 | 115 | 51 | 3 | 9 | 261 | 8 | 19.3128 | 10 |
| 18-11.14 | 23 86 154 | 14 | 48 | 36 | 11 | 0 | 0 | 0 | 0 | 0 | 113 | 48 | 3 | 51 | 694 | 9 | 19.3141 | 14 |
| 18-11.17 | 23 88 148 | 16 | 48 | 36 | 11 | 0 | 0 | 0 | 0 | 0 | 113 | 48 | 3 | 53 | 695 | 10 | 19.3145 | 16 |

k = 18, Design generators

| Design | Design Generators | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-11.1 | 7 | 25 | 42 | 53 | 62 | 78 | 83 | 92 | 99 | 111 | 120 |
| 18-11.2 | 7 | 11 | 25 | 45 | 51 | 62 | 78 | 84 | 90 | 101 | 120 |
| 18-11.3 | 7 | 11 | 21 | 45 | 51 | 62 | 78 | 86 | 97 | 103 | 120 |
| 18-11.4 | 7 | 11 | 25 | 42 | 77 | 81 | 95 | 99 | 110 | 118 | 120 |
| 18-11.5 | 7 | 11 | 21 | 41 | 54 | 58 | 79 | 86 | 92 | 99 | 120 |
| 18-11.6 | 7 | 11 | 21 | 38 | 57 | 76 | 83 | 90 | 111 | 118 | 120 |
| 18-11.7 | 7 | 11 | 21 | 38 | 57 | 76 | 83 | 90 | 101 | 118 | 120 |
| 18-11.8 | 7 | 11 | 21 | 41 | 51 | 63 | 77 | 84 | 110 | 118 | 120 |
| 18-11.9 | 7 | 11 | 19 | 41 | 53 | 63 | 78 | 82 | 99 | 118 | 120 |
| 18-11.10a | 7 | 11 | 19 | 29 | 41 | 53 | 74 | 84 | 111 | 118 | 120 |
| 18-11.10b | 7 | 11 | 19 | 38 | 57 | 60 | 77 | 85 | 91 | 101 | 120 |
| 18-11.12a | 7 | 11 | 19 | 41 | 53 | 63 | 78 | 82 | 95 | 99 | 120 |
| 18-11.12b | 7 | 11 | 19 | 41 | 53 | 63 | 78 | 82 | 95 | 100 | 120 |
| 18-11.14 | 7 | 11 | 21 | 38 | 59 | 73 | 83 | 95 | 106 | 118 | 120 |
| 18-11.15 | 7 | 11 | 19 | 29 | 41 | 53 | 74 | 85 | 110 | 118 | 120 |
| 18-11.16 | 7 | 11 | 19 | 29 | 38 | 41 | 69 | 91 | 106 | 116 | 120 |
| 18-11.17 | 7 | 11 | 21 | 25 | 38 | 58 | 78 | 84 | 101 | 107 | 120 |
| 18-11.18 | 7 | 11 | 19 | 38 | 57 | 60 | 73 | 85 | 106 | 118 | 120 |
| 18-11.19 | 7 | 11 | 19 | 29 | 41 | 53 | 73 | 86 | 102 | 106 | 120 |
| 18-11.20 | 7 | 11 | 21 | 25 | 38 | 58 | 77 | 83 | 101 | 118 | 120 |
| 18-11.5146 | 7 | 11 | 19 | 25 | 26 | 28 | 35 | 45 | 86 | 110 | 120 |
| 18-11.5147 | 7 | 11 | 13 | 19 | 21 | 25 | 41 | 63 | 78 | 118 | 120 |
| 18-11.6397 | 7 | 11 | 13 | 19 | 25 | 26 | 46 | 49 | 85 | 109 | 120 |
| 18-11.14398 | 7 | 11 | 19 | 25 | 26 | 28 | 31 | 45 | 77 | 110 | 120 |
| 18-11.15386 | 7 | 11 | 13 | 19 | 21 | 25 | 26 | 46 | 92 | 103 | 120 |
| 18-11.15397a | 7 | 11 | 13 | 19 | 21 | 25 | 26 | 46 | 78 | 100 | 120 |
| 18-11.15397b | 7 | 11 | 13 | 19 | 21 | 25 | 26 | 46 | 78 | 118 | 120 |
| 18-11.16125 | 7 | 11 | 19 | 25 | 26 | 28 | 31 | 45 | 77 | 117 | 120 |
| 18-11.23841a | 7 | 11 | 13 | 19 | 21 | 25 | 26 | 28 | 46 | 78 | 120 |
| 18-11.23841b | 7 | 11 | 13 | 19 | 21 | 25 | 26 | 28 | 46 | 95 | 120 |

k = 19, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19-12.1 | 27 120 235 | 1 | 36 | 54 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 36 | 3 | 22 | 5807 | 1 | 17.4063 | 1 |
| 19-12.2 | 28 122 220 | 2 | 45 | 42 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 45 | 3 | 3 | 681 | 2 | 17.4091 | 2 |
| 19-12.3 | 30 110 240 | 3 | 32 | 51 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 114 | 32 | 4 | 387 | 11720 | 8 | 17.4115 | 3 |
| 19-12.4 | 30 114 228 | 4 | 42 | 39 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 42 | 3 | 52 | 1582 | 3 | 17.4123 | 5 |
| 19-12.5 | 30 116 220 | 5 | 40 | 45 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 117 | 40 | 4 | 53 | 2540 | 9 | 17.4127 | 6 |
| 19-12.6 | 30 118 214 | 6 | 45 | 36 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 45 | 3 | 23 | 682 | 4 | 17.4131 | 7 |
| 19-12.7 | 30 118 214 | 7 | 47 | 36 | 16 | 1 | 0 | 0 | 0 | 0 | 0 | 119 | 47 | 4 | 10 | 384 | 10 | 17.4131 | 7 |
| 19-12.8 | 30 118 214 | 7 | 44 | 39 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 118 | 44 | 4 | 24 | 937 | 11 | 17.4131 | 7 |
| 19-12.9 | 30 118 216 | 9 | 44 | 39 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 118 | 44 | 4 | 25 | 938 | 12 | 17.4131 | 10 |
| 19-12.10 | 30 120 212 | 10 | 42 | 51 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 119 | 42 | 4 | 11 | 1583 | 13 | 17.4135 | 11 |
| 19-12.11 | 30 121 208 | 11 | 47 | 36 | 16 | 1 | 0 | 0 | 0 | 0 | 0 | 119 | 47 | 4 | 12 | 385 | 14 | 17.4137 | 12 |
| 19-12.12 | 30 122 208 | 12 | 50 | 33 | 17 | 1 | 0 | 0 | 0 | 0 | 0 | 120 | 50 | 4 | 5 | 170 | 16 | 17.4140 | 13 |
| 19-12.13 | 30 122 208 | 12 | 46 | 45 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 120 | 46 | 4 | 4 | 517 | 15 | 17.4140 | 13 |
| 19-12.14 | 31 100 271 | 14 | 30 | 48 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 112 | 30 | 3 | 970 | 15112 | 5 | 17.4121 | 4 |
| 19-12.15 | 31 116 210 | 15 | 43 | 39 | 14 | 2 | 0 | 0 | 0 | 0 | 0 | 117 | 43 | 4 | 54 | 1286 | 17 | 17.4150 | 15 |
| 19-12.16 | 31 116 215 | 16 | 46 | 36 | 15 | 2 | 0 | 0 | 0 | 0 | 0 | 118 | 46 | 4 | 26 | 518 | 18 | 17.4151 | 16 |
| 19-12.17a | 31 116 215 | 16 | 40 | 42 | 13 | 2 | 0 | 0 | 0 | 0 | 0 | 116 | 40 | 4 | 107 | 2541 | 19 | 17.4151 | 16 |
| 19-12.17b | 31 116 215 | 16 | 40 | 42 | 13 | 2 | 0 | 0 | 0 | 0 | 0 | 116 | 40 | 4 | 107 | 2541 | 19 | 17.4151 | 16 |
| 19-12.19 | 31 116 219 | 19 | 50 | 30 | 19 | 1 | 0 | 0 | 0 | 0 | 0 | 119 | 50 | 4 | 13 | 171 | 21 | 17.4152 | 19 |
| 19-12.20a | 31 117 210 | 20 | 46 | 36 | 15 | 2 | 0 | 0 | 0 | 0 | 0 | 118 | 46 | 4 | 27 | 519 | 22 | 17.4153 | 20 |
| 19-12.20b | 31 117 210 | 20 | 46 | 36 | 15 | 2 | 0 | 0 | 0 | 0 | 0 | 118 | 46 | 4 | 27 | 519 | 22 | 17.4153 | 20 |

k = 19, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19-12.12482 | 46 102 192 | 12482 | 74 | 15 | 0 | 12 | 0 | 2 | 1 | 0 | 0 | 123 | 74 | 7 | 1 | 3 | 35208 | 17.4498 | 16695 |
| 19-12.6923 | 42 106 200 | 6923 | 70 | 8 | 17 | 2 | 4 | 1 | 0 | 0 | 0 | 121 | 70 | 6 | 2 | 7 | 22319 | 17.4407 | 9180 |
| 19-12.2 | 28 122 220 | 2 | 45 | 42 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 45 | 3 | 3 | 681 | 2 | 17.4091 | 2 |
| 19-12.13 | 30 122 208 | 12 | 46 | 45 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 120 | 46 | 4 | 4 | 517 | 15 | 17.4140 | 13 |
| 19-12.12 | 30 122 208 | 12 | 50 | 33 | 17 | 1 | 0 | 0 | 0 | 0 | 0 | 120 | 50 | 4 | 5 | 170 | 16 | 17.4140 | 13 |
| 19-12.161 | 33 117 198 | 161 | 53 | 32 | 11 | 4 | 1 | 0 | 0 | 0 | 0 | 120 | 53 | 5 | 6 | 91 | 2587 | 17.4202 | 164 |
| 19-12.3218 | 39 116 187 | 3218 | 59 | 26 | 9 | 4 | 1 | 2 | 0 | 0 | 0 | 120 | 59 | 6 | 7 | 39 | 21728 | 17.4353 | 5406 |
| 19-12.12483 | 46 102 192 | 12482 | 69 | 16 | 1 | 9 | 5 | 1 | 0 | 0 | 0 | 120 | 69 | 6 | 8 | 8 | 24025 | 17.4498 | 16695 |
| 19-12.14059 | 47 100 187 | 14059 | 68 | 18 | 0 | 12 | 0 | 2 | 1 | 0 | 0 | 120 | 68 | 7 | 9 | 11 | 35317 | 17.4518 | 18094 |
| 19-12.7 | 30 118 214 | 7 | 47 | 36 | 16 | 1 | 0 | 0 | 0 | 0 | 0 | 119 | 47 | 4 | 10 | 384 | 10 | 17.4131 | 7 |

k = 19, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19-12.26380a | 58 90 184 | 26380 | 78 | 6 | 1 | 0 | 12 | 3 | 0 | 0 | 0 | 119 | 78 | 6 | 20 | 1 | 29308 | 17.4777 | 33773 |
| 19-12.26380b | 58 90 184 | 26380 | 78 | 6 | 1 | 0 | 12 | 3 | 0 | 0 | 0 | 119 | 78 | 6 | 20 | 1 | 29308 | 17.4777 | 33773 |
| 19-12.12482 | 46 102 192 | 12482 | 74 | 15 | 0 | 12 | 0 | 2 | 1 | 0 | 0 | 123 | 74 | 7 | 1 | 3 | 35208 | 17.4498 | 16695 |
| 19-12.38700 | 78 70 224 | 38700 | 74 | 3 | 0 | 0 | 0 | 14 | 1 | 0 | 0 | 111 | 74 | 7 | 1911 | 4 | 38310 | 17.5257 | 38922 |
| 19-12.31264 | 62 86 164 | 31264 | 72 | 0 | 7 | 0 | 12 | 3 | 0 | 0 | 0 | 113 | 72 | 6 | 968 | 5 | 30857 | 17.4865 | 36481 |
| 19-12.31266 | 62 90 160 | 31266 | 72 | 0 | 7 | 0 | 12 | 3 | 0 | 0 | 0 | 113 | 72 | 6 | 969 | 6 | 30858 | 17.4875 | 36579 |
| 19-12.6923 | 42 106 200 | 6923 | 70 | 8 | 17 | 2 | 4 | 1 | 0 | 0 | 0 | 121 | 70 | 6 | 2 | 7 | 22319 | 17.4407 | 9180 |
| 19-12.12483 | 46 102 192 | 12482 | 69 | 16 | 1 | 9 | 5 | 1 | 0 | 0 | 0 | 120 | 69 | 6 | 8 | 8 | 24025 | 17.4498 | 16695 |
| 19-12.27425 | 59 86 182 | 27425 | 69 | 12 | 0 | 0 | 12 | 3 | 0 | 0 | 0 | 115 | 69 | 6 | 386 | 9 | 29630 | 17.4792 | 34647 |

k = 19, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,...) | | | wlp rank | alp | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19-12.1 | 27 | 120 | 235 | 1 | 36 | 54 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 36 | 3 | 22 | 5807 | 1 | 17.4063 | 1 |
| 19-12.2 | 28 | 122 | 220 | 2 | 45 | 42 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 45 | 3 | 3 | 681 | 2 | 17.4091 | 2 |
| 19-12.4 | 30 | 114 | 228 | 4 | 42 | 39 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 42 | 3 | 52 | 1582 | 3 | 17.4123 | 5 |
| 19-12.6 | 30 | 118 | 214 | 6 | 45 | 36 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 45 | 3 | 23 | 682 | 4 | 17.4131 | 7 |
| 19-12.14 | 31 | 100 | 271 | 14 | 30 | 48 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 112 | 30 | 3 | 970 | 15112 | 5 | 17.4121 | 4 |
| 19-12.640 | 36 | 90 | 252 | 640 | 45 | 18 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 112 | 45 | 3 | 1053 | 722 | 6 | 17.4219 | 299 |
| 19-12.18529 | 51 | 0 | 483 | 18529 | 0 | 18 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 82 | 0 | 3 | 27971 | 39241 | 7 | 17.4415 | 9659 |
| 19-12.3 | 30 | 110 | 240 | 3 | 32 | 51 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 114 | 32 | 4 | 387 | 11720 | 8 | 17.4115 | 3 |
| 19-12.5 | 30 | 116 | 220 | 5 | 40 | 45 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 117 | 40 | 4 | 53 | 2540 | 9 | 17.4127 | 6 |
| 19-12.7 | 30 | 118 | 214 | 7 | 47 | 36 | 16 | 1 | 0 | 0 | 0 | 0 | 0 | 119 | 47 | 4 | 10 | 384 | 10 | 17.4131 | 7 |

k = 19, Design generators

| Design | Design Generators | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19-12.1 | 7 | 11 | 21 | 41 | 54 | 58 | 79 | 86 | 92 | 99 | 101 | 120 |
| 19-12.2 | 7 | 11 | 21 | 38 | 57 | 76 | 83 | 90 | 101 | 111 | 118 | 120 |
| 19-12.3 | 7 | 11 | 19 | 38 | 59 | 62 | 73 | 87 | 93 | 101 | 106 | 120 |
| 19-12.4 | 7 | 11 | 21 | 38 | 59 | 73 | 83 | 95 | 101 | 106 | 118 | 120 |
| 19-12.5 | 7 | 11 | 19 | 38 | 57 | 60 | 73 | 85 | 95 | 101 | 106 | 120 |
| 19-12.6 | 7 | 11 | 21 | 38 | 57 | 73 | 83 | 95 | 101 | 107 | 118 | 120 |
| 19-12.7 | 7 | 11 | 19 | 38 | 57 | 60 | 73 | 84 | 99 | 110 | 118 | 120 |
| 19-12.8 | 7 | 11 | 19 | 38 | 57 | 60 | 73 | 85 | 99 | 110 | 118 | 120 |
| 19-12.9 | 7 | 11 | 21 | 25 | 38 | 55 | 58 | 78 | 84 | 101 | 107 | 120 |
| 19-12.10 | 7 | 11 | 19 | 30 | 41 | 52 | 61 | 74 | 87 | 101 | 111 | 120 |
| 19-12.11 | 7 | 11 | 19 | 29 | 41 | 53 | 63 | 78 | 82 | 99 | 118 | 120 |
| 19-12.12 | 7 | 11 | 19 | 29 | 41 | 53 | 63 | 78 | 82 | 95 | 99 | 120 |
| 19-12.13 | 7 | 11 | 19 | 25 | 41 | 53 | 63 | 78 | 82 | 95 | 100 | 120 |
| 19-12.14 | 7 | 11 | 21 | 41 | 55 | 58 | 78 | 86 | 92 | 99 | 101 | 120 |
| 19-12.15 | 7 | 11 | 19 | 38 | 57 | 60 | 73 | 85 | 92 | 99 | 118 | 120 |
| 19-12.16 | 7 | 11 | 21 | 38 | 57 | 76 | 83 | 90 | 111 | 118 | 120 | 123 |
| 19-12.17a | 7 | 11 | 21 | 25 | 38 | 41 | 58 | 78 | 84 | 101 | 107 | 120 |
| 19-12.17b | 7 | 11 | 19 | 29 | 38 | 57 | 60 | 73 | 85 | 106 | 118 | 120 |
| 19-12.19 | 7 | 11 | 21 | 25 | 38 | 44 | 58 | 77 | 83 | 101 | 118 | 120 |
| 19-12.20a | 7 | 11 | 19 | 29 | 38 | 41 | 60 | 69 | 91 | 106 | 116 | 120 |
| 19-12.20b | 7 | 11 | 19 | 29 | 38 | 41 | 55 | 73 | 85 | 108 | 118 | 120 |
| 19-12.161 | 7 | 11 | 19 | 29 | 35 | 41 | 55 | 73 | 87 | 102 | 108 | 120 |
| 19-12.640 | 7 | 11 | 21 | 38 | 57 | 76 | 87 | 93 | 98 | 107 | 118 | 120 |
| 19-12.3218 | 7 | 11 | 19 | 25 | 26 | 28 | 35 | 45 | 53 | 78 | 118 | 120 |
| 19-12.6923 | 7 | 11 | 19 | 25 | 26 | 28 | 35 | 45 | 50 | 86 | 110 | 120 |
| 19-12.12482 | 7 | 11 | 19 | 25 | 26 | 28 | 31 | 35 | 45 | 86 | 110 | 120 |
| 19-12.12483 | 7 | 11 | 19 | 21 | 25 | 26 | 28 | 35 | 45 | 86 | 110 | 120 |
| 19-12.14059 | 7 | 11 | 19 | 25 | 26 | 28 | 31 | 35 | 45 | 77 | 118 | 120 |
| 19-12.18529 | 7 | 21 | 28 | 38 | 44 | 59 | 79 | 81 | 98 | 112 | 121 | 122 |
| 19-12.26380a | 7 | 11 | 14 | 19 | 25 | 26 | 28 | 31 | 45 | 77 | 110 | 120 |
| 19-12.26380b | 7 | 11 | 14 | 19 | 25 | 26 | 28 | 31 | 45 | 77 | 117 | 120 |
| 19-12.27425 | 7 | 11 | 13 | 19 | 21 | 22 | 25 | 26 | 46 | 92 | 103 | 120 |
| 19-12.31264 | 7 | 11 | 13 | 19 | 21 | 22 | 25 | 26 | 46 | 78 | 118 | 120 |
| 19-12.31266 | 7 | 11 | 19 | 21 | 25 | 26 | 28 | 31 | 45 | 77 | 117 | 120 |
| 19-12.38700 | 7 | 27 | 43 | 51 | 56 | 75 | 83 | 88 | 99 | 104 | 112 | 125 |

k = 20, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20-13.1 | 36 152 340 | 1 | 24 | 60 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 24 | 4 | 111 | 28084 | 1 | 15.6994 | 1 |
| 20-13.2 | 38 156 310 | 2 | 41 | 39 | 21 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 41 | 4 | 6 | 715 | 2 | 15.7043 | 2 |
| 20-13.3 | 39 152 308 | 3 | 40 | 39 | 20 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 40 | 4 | 11 | 1032 | 3 | 15.7056 | 3 |
| 20-13.4 | 39 152 308 | 3 | 38 | 39 | 22 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 38 | 4 | 26 | 1929 | 4 | 15.7056 | 3 |
| 20-13.5 | 40 148 316 | 5 | 34 | 42 | 20 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 34 | 4 | 111 | 5165 | 6 | 15.7072 | 5 |
| 20-13.6 | 40 148 316 | 5 | 30 | 54 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 30 | 4 | 111 | 11873 | 5 | 15.7072 | 5 |
| 20-13.7 | 40 152 308 | 7 | 36 | 42 | 18 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 36 | 4 | 54 | 3164 | 7 | 15.7080 | 7 |
| 20-13.8 | 40 153 300 | 8 | 39 | 39 | 19 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 39 | 4 | 27 | 1501 | 8 | 15.7080 | 8 |
| 20-13.9 | 40 154 298 | 9 | 40 | 42 | 14 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 40 | 4 | 12 | 1033 | 9 | 15.7082 | 9 |
| 20-13.10 | 40 154 298 | 9 | 39 | 39 | 19 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 39 | 4 | 28 | 1502 | 10 | 15.7082 | 10 |
| 20-13.11 | 40 156 296 | 11 | 31 | 60 | 4 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 121 | 31 | 5 | 29 | 9924 | 485 | 15.7087 | 12 |
| 20-13.12 | 40 156 300 | 12 | 40 | 42 | 14 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 40 | 4 | 13 | 1034 | 11 | 15.7088 | 13 |
| 20-13.13 | 41 144 312 | 13 | 32 | 45 | 16 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 32 | 4 | 230 | 7874 | 12 | 15.7085 | 11 |
| 20-13.14 | 41 150 301 | 14 | 41 | 36 | 19 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 41 | 4 | 30 | 716 | 13 | 15.7097 | 16 |
| 20-13.15 | 41 150 301 | 15 | 36 | 39 | 20 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 36 | 4 | 115 | 3165 | 15 | 15.7097 | 14 |
| 20-13.16 | 41 150 301 | 15 | 35 | 42 | 17 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 35 | 4 | 114 | 4168 | 14 | 15.7097 | 14 |
| 20-13.17 | 41 152 294 | 17 | 43 | 35 | 20 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 122 | 43 | 5 | 14 | 415 | 486 | 15.7100 | 17 |
| 20-13.18 | 41 152 294 | 17 | 39 | 36 | 21 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 39 | 4 | 55 | 1503 | 16 | 15.7100 | 17 |
| 20-13.19 | 41 152 295 | 19 | 39 | 36 | 21 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 39 | 4 | 55 | 1504 | 17 | 15.7100 | 19 |
| 20-13.20 | 41 152 296 | 20 | 46 | 27 | 26 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 46 | 4 | 15 | 190 | 18 | 15.7100 | 20 |
| 20-13.21 | 41 152 296 | 20 | 36 | 45 | 12 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 36 | 4 | 57 | 3166 | 19 | 15.7100 | 20 |

k = 20, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20-13.23128 | 64 128 280 | 23128 | 72 | 18 | 1 | 0 | 12 | 2 | 1 | 0 | 0 | 0 | 126 | 72 | 7 | 1 | 4 | 47887 | 15.7578 | 30523 |
| 20-13.47458 | 80 112 280 | 47458 | 84 | 6 | 1 | 0 | 0 | 14 | 1 | 0 | 0 | 0 | 126 | 84 | 7 | 2 | 1 | 51633 | 15.7915 | 55382 |
| 20-13.7545 | 54 148 266 | 7545 | 59 | 30 | 1 | 12 | 0 | 1 | 2 | 0 | 0 | 0 | 125 | 59 | 7 | 3 | 13 | 45588 | 15.7390 | 12963 |
| 20-13.58 | 42 154 284 | 58 | 46 | 39 | 13 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 124 | 46 | 5 | 4 | 191 | 497 | 15.7126 | 61 |
| 20-13.16206 | 60 132 272 | 16206 | 70 | 6 | 13 | 12 | 0 | 0 | 3 | 0 | 0 | 0 | 124 | 70 | 7 | 5 | 5 | 46802 | 15.7491 | 23100 |
| 20-13.2 | 38 156 310 | 2 | 41 | 39 | 21 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 41 | 4 | 6 | 715 | 2 | 15.7043 | 2 |
| 20-13.62 | 42 156 286 | 62 | 50 | 23 | 27 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 123 | 50 | 5 | 7 | 64 | 501 | 15.7131 | 74 |
| 20-13.63 | 42 156 286 | 62 | 38 | 55 | 3 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 123 | 38 | 5 | 8 | 1933 | 502 | 15.7131 | 73 |

k = 20, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20-13.47458 | 80 112 280 | 47458 | 84 | 6 | 1 | 0 | 0 | 14 | 1 | 0 | 0 | 0 | 126 | 84 | 7 | 2 | 1 | 51633 | 15.7915 | 55382 |
| 20-13.52497 | 84 108 256 | 52497 | 78 | 0 | 7 | 0 | 0 | 14 | 1 | 0 | 0 | 0 | 120 | 78 | 7 | 110 | 2 | 52866 | 15.7993 | 56241 |
| 20-13.50328 | 82 108 270 | 50328 | 75 | 9 | 2 | 0 | 0 | 14 | 1 | 0 | 0 | 0 | 121 | 75 | 7 | 53 | 3 | 52274 | 15.7950 | 55770 |
| 20-13.23128 | 64 128 280 | 23128 | 72 | 18 | 1 | 0 | 12 | 2 | 1 | 0 | 0 | 0 | 126 | 72 | 7 | 1 | 4 | 47887 | 15.7578 | 30523 |
| 20-13.16206 | 60 132 272 | 16206 | 70 | 6 | 13 | 12 | 0 | 0 | 3 | 0 | 0 | 0 | 124 | 70 | 7 | 5 | 5 | 46802 | 15.7491 | 23100 |
| 20-13.57639 | 108 84 336 | 57639 | 70 | 6 | 1 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 112 | 70 | 7 | 3369 | 6 | 55270 | 15.8520 | 57809 |

k = 20, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20-13.1 | 36 152 340 | 1 | 24 | 60 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 24 | 4 | 111 | 28084 | 1 | 15.6994 | 1 |
| 20-13.2 | 38 156 310 | 2 | 41 | 39 | 21 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 41 | 4 | 6 | 715 | 2 | 15.7043 | 2 |
| 20-13.3 | 39 152 308 | 3 | 40 | 39 | 20 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 40 | 4 | 11 | 1032 | 3 | 15.7056 | 3 |
| 20-13.4 | 39 152 308 | 3 | 38 | 39 | 22 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 38 | 4 | 26 | 1929 | 4 | 15.7056 | 3 |
| 20-13.6 | 40 148 316 | 5 | 30 | 54 | 8 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 30 | 4 | 111 | 11873 | 5 | 15.7072 | 5 |
| 20-13.5 | 40 148 316 | 5 | 34 | 42 | 20 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 34 | 4 | 111 | 5165 | 6 | 15.7072 | 5 |
| 20-13.7 | 40 152 308 | 7 | 36 | 42 | 18 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 36 | 4 | 54 | 3164 | 7 | 15.7080 | 7 |
| 20-13.8 | 40 153 300 | 8 | 39 | 39 | 19 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 39 | 4 | 27 | 1501 | 8 | 15.7080 | 8 |
| 20-13.9 | 40 154 298 | 9 | 40 | 42 | 14 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 40 | 4 | 12 | 1033 | 9 | 15.7082 | 9 |
| 20-13.10 | 40 154 298 | 9 | 39 | 39 | 19 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 39 | 4 | 28 | 1502 | 10 | 15.7082 | 10 |

k = 20, Design generators

| Design | Design Generators | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20-13.1 | 7 | 11 | 21 | 41 | 54 | 58 | 79 | 86 | 92 | 99 | 101 | 120 | 123 |
| 20-13.2 | 7 | 11 | 21 | 38 | 60 | 70 | 73 | 82 | 95 | 101 | 107 | 118 | 120 |
| 20-13.3 | 7 | 11 | 19 | 38 | 57 | 60 | 73 | 84 | 93 | 99 | 110 | 118 | 120 |
| 20-13.4 | 7 | 11 | 19 | 38 | 57 | 60 | 73 | 85 | 92 | 99 | 110 | 118 | 120 |
| 20-13.5 | 7 | 11 | 19 | 29 | 38 | 57 | 60 | 73 | 85 | 95 | 106 | 118 | 120 |
| 20-13.6 | 7 | 11 | 14 | 19 | 38 | 57 | 60 | 73 | 85 | 95 | 101 | 106 | 120 |
| 20-13.7 | 7 | 11 | 21 | 25 | 38 | 41 | 55 | 58 | 78 | 84 | 101 | 107 | 120 |
| 20-13.8 | 7 | 11 | 21 | 25 | 38 | 55 | 58 | 78 | 84 | 93 | 101 | 107 | 120 |
| 20-13.9 | 7 | 11 | 13 | 21 | 38 | 57 | 76 | 83 | 90 | 101 | 111 | 118 | 120 |
| 20-13.10 | 7 | 11 | 19 | 29 | 38 | 57 | 60 | 73 | 85 | 91 | 106 | 118 | 120 |
| 20-13.11 | 7 | 11 | 19 | 30 | 35 | 41 | 73 | 84 | 93 | 101 | 111 | 114 | 120 |
| 20-13.12 | 7 | 11 | 19 | 29 | 41 | 47 | 49 | 55 | 91 | 94 | 99 | 102 | 120 |
| 20-13.13 | 7 | 11 | 19 | 38 | 57 | 60 | 73 | 85 | 95 | 101 | 106 | 119 | 120 |
| 20-13.14 | 7 | 11 | 21 | 38 | 57 | 63 | 76 | 83 | 90 | 111 | 118 | 120 | 123 |
| 20-13.15 | 7 | 11 | 19 | 29 | 38 | 57 | 60 | 73 | 85 | 99 | 110 | 118 | 120 |
| 20-13.16 | 7 | 11 | 21 | 25 | 38 | 41 | 58 | 78 | 82 | 84 | 101 | 107 | 120 |
| 20-13.17 | 7 | 11 | 13 | 19 | 38 | 57 | 60 | 73 | 85 | 92 | 99 | 118 | 120 |
| 20-13.18 | 7 | 11 | 21 | 38 | 59 | 73 | 81 | 82 | 95 | 99 | 108 | 117 | 120 |
| 20-13.19 | 7 | 11 | 19 | 29 | 38 | 57 | 60 | 70 | 73 | 99 | 110 | 118 | 120 |
| 20-13.20 | 7 | 11 | 19 | 30 | 38 | 41 | 52 | 59 | 74 | 85 | 111 | 118 | 120 |
| 20-13.21 | 7 | 11 | 19 | 30 | 41 | 49 | 52 | 61 | 74 | 87 | 101 | 111 | 120 |
| 20-13.58 | 7 | 11 | 19 | 29 | 41 | 55 | 62 | 74 | 84 | 102 | 108 | 111 | 120 |
| 20-13.62 | 7 | 11 | 19 | 29 | 30 | 41 | 53 | 63 | 78 | 82 | 95 | 99 | 120 |
| 20-13.63 | 7 | 11 | 19 | 25 | 26 | 41 | 53 | 63 | 78 | 82 | 95 | 100 | 120 |
| 20-13.7545 | 7 | 11 | 19 | 25 | 26 | 28 | 31 | 35 | 45 | 53 | 86 | 110 | 120 |
| 20-13.16206 | 7 | 11 | 19 | 25 | 26 | 28 | 31 | 35 | 45 | 59 | 86 | 110 | 120 |
| 20-13.23128 | 7 | 11 | 19 | 21 | 25 | 26 | 28 | 31 | 35 | 45 | 86 | 110 | 120 |
| 20-13.47458 | 7 | 11 | 14 | 19 | 22 | 25 | 26 | 28 | 31 | 45 | 77 | 117 | 120 |
| 20-13.50328 | 7 | 11 | 13 | 19 | 21 | 22 | 25 | 26 | 31 | 46 | 78 | 100 | 120 |
| 20-13.52497 | 7 | 11 | 14 | 19 | 21 | 25 | 26 | 28 | 31 | 45 | 77 | 117 | 120 |
| 20-13.57639 | 7 | 27 | 43 | 51 | 56 | 75 | 83 | 88 | 99 | 104 | 112 | 123 | 125 |

k = 21, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-14.1 | 51 200 414 | 1 | 26 | 54 | 15 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 123 | 26 | 5 | 23 | 17819 | 45 | 14.1759 | 2 |
| 21-14.2 | 51 202 400 | 2 | 28 | 51 | 12 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 28 | 4 | 24 | 10484 | 1 | 14.1761 | 3 |
| 21-14.3 | 52 184 452 | 3 | 24 | 48 | 18 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 24 | 4 | 244 | 25188 | 2 | 14.1753 | 1 |
| 21-14.4 | 52 194 420 | 4 | 31 | 38 | 26 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 122 | 31 | 5 | 57 | 5419 | 46 | 14.1768 | 4 |
| 21-14.5 | 52 196 412 | 5 | 33 | 38 | 24 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 123 | 33 | 5 | 25 | 3019 | 47 | 14.1771 | 5 |
| 21-14.6 | 52 196 416 | 6 | 36 | 36 | 22 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 36 | 4 | 9 | 1156 | 3 | 14.1772 | 7 |
| 21-14.7 | 52 198 402 | 7 | 35 | 39 | 19 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 35 | 4 | 10 | 1882 | 4 | 14.1774 | 8 |
| 21-14.8 | 52 201 400 | 8 | 36 | 48 | 16 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 127 | 36 | 5 | 1 | 1157 | 48 | 14.1780 | 9 |
| 21-14.9 | 53 184 440 | 9 | 8 | 66 | 12 | 7 | 0 | 1 | 0 | 0 | 0 | 0 | 115 | 8 | 6 | 1698 | 40852 | 8560 | 14.1772 | 6 |
| 21-14.10 | 53 190 422 | 10 | 34 | 39 | 18 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 34 | 4 | 26 | 2365 | 5 | 14.1781 | 10 |
| 21-14.11 | 53 190 422 | 10 | 32 | 39 | 20 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 32 | 4 | 58 | 3933 | 6 | 14.1781 | 10 |
| 21-14.12 | 53 192 412 | 12 | 32 | 45 | 12 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 32 | 4 | 27 | 3934 | 7 | 14.1783 | 12 |
| 21-14.13 | 53 193 413 | 13 | 34 | 37 | 24 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 123 | 34 | 5 | 28 | 2366 | 49 | 14.1786 | 13 |
| 21-14.14 | 53 193 413 | 13 | 29 | 41 | 22 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 121 | 29 | 5 | 120 | 8257 | 50 | 14.1786 | 13 |
| 21-14.15 | 53 194 405 | 15 | 36 | 36 | 24 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 124 | 36 | 6 | 11 | 1158 | 8561 | 14.1787 | 15 |
| 21-14.16 | 53 195 401 | 16 | 37 | 35 | 22 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 124 | 37 | 5 | 12 | 914 | 51 | 14.1788 | 16 |
| 21-14.17 | 53 196 404 | 17 | 41 | 33 | 24 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 41 | 5 | 6 | 240 | 52 | 14.1791 | 18 |
| 21-14.18 | 53 196 404 | 17 | 34 | 39 | 18 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 34 | 4 | 29 | 2367 | 8 | 14.1791 | 17 |
| 21-14.19 | 53 199 395 | 19 | 29 | 47 | 14 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 122 | 29 | 5 | 59 | 8258 | 53 | 14.1795 | 19 |
| 21-14.20 | 53 200 400 | 20 | 20 | 72 | 0 | 7 | 0 | 3 | 0 | 0 | 0 | 0 | 123 | 20 | 6 | 30 | 34343 | 8562 | 14.1799 | 22 |
| 21-14.21 | 54 186 438 | 21 | 32 | 35 | 25 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 121 | 32 | 5 | 121 | 3935 | 54 | 14.1796 | 20 |

k = 21, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-14.8 | 52 | 201 | 400 | 8 | 36 | 48 | 16 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 127 | 36 | 5 | 1 | 1157 | 48 | 14.1780 | 9 |
| 21-14.110 | 56 | 189 | 392 | 110 | 56 | 0 | 49 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 127 | 56 | 7 | 2 | 8 | 51208 | 14.1836 | 113 |
| 21-14.2560 | 64 | 181 | 392 | 2560 | 62 | 0 | 37 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 127 | 62 | 7 | 3 | 3 | 51401 | 14.1986 | 4100 |
| 21-14.23744 | 80 | 165 | 392 | 23744 | 72 | 0 | 19 | 0 | 12 | 0 | 3 | 0 | 0 | 0 | 127 | 72 | 7 | 4 | 2 | 56822 | 14.2290 | 7684 |
| 21-14.80683 | 112 | 133 | 392 | 80683 | 84 | 0 | 7 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 127 | 84 | 7 | 5 | 1 | 74585 | 14.2896 | 82077 |
| 21-14.17 | 53 | 196 | 404 | 17 | 41 | 33 | 24 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 41 | 5 | 6 | 240 | 52 | 14.1791 | 18 |
| 21-14.225 | 57 | 196 | 376 | 225 | 44 | 30 | 24 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 126 | 44 | 6 | 7 | 79 | 8605 | 14.1869 | 331 |
| 21-14.7379 | 69 | 196 | 364 | 7379 | 54 | 23 | 12 | 13 | 0 | 0 | 2 | 1 | 0 | 0 | 126 | 54 | 8 | 8 | 10 | 75434 | 14.2121 | 16832 |
| 21-14.6 | 52 | 196 | 416 | 6 | 36 | 36 | 22 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 36 | 4 | 9 | 1156 | 3 | 14.1772 | 7 |
| 21-14.7 | 52 | 198 | 402 | 7 | 35 | 39 | 19 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 35 | 4 | 10 | 1882 | 4 | 14.1774 | 8 |

k = 21, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-14.80683 | 112 | 133 | 392 | 80683 | 84 | 0 | 7 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 127 | 84 | 7 | 5 | 1 | 74585 | 14.2896 | 82077 |
| 21-14.23744 | 80 | 165 | 392 | 23744 | 72 | 0 | 19 | 0 | 12 | 0 | 3 | 0 | 0 | 0 | 127 | 72 | 7 | 4 | 2 | 56822 | 14.2290 | 37684 |
| 21-14.2560 | 64 | 181 | 392 | 2560 | 62 | 0 | 37 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 127 | 62 | 7 | 3 | 3 | 51401 | 14.1986 | 4100 |
| 21-14.18122 | 77 | 164 | 404 | 18122 | 62 | 9 | 6 | 19 | 0 | 6 | 0 | 0 | 0 | 0 | 123 | 62 | 6 | 56 | 4 | 17698 | 14.2227 | 28548 |
| 21-14.41505 | 93 | 148 | 372 | 41505 | 62 | 17 | 6 | 1 | 0 | 14 | 0 | 1 | 0 | 0 | 122 | 62 | 8 | 119 | 5 | 77854 | 14.2523 | 74961 |
| 21-14.38737 | 92 | 148 | 380 | 38737 | 60 | 20 | 6 | 0 | 0 | 14 | 0 | 1 | 0 | 0 | 122 | 60 | 8 | 118 | 6 | 77767 | 14.2503 | 73985 |
| 21-14.29904 | 84 | 153 | 384 | 29904 | 57 | 8 | 17 | 0 | 13 | 0 | 3 | 0 | 0 | 0 | 119 | 57 | 7 | 617 | 7 | 58605 | 14.2346 | 51023 |
| 21-14.110 | 56 | 189 | 392 | 110 | 56 | 0 | 49 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 127 | 56 | 7 | 2 | 8 | 51208 | 14.1836 | 113 |
| 21-14.28450 | 83 | 153 | 391 | 28450 | 55 | 12 | 14 | 2 | 12 | 0 | 3 | 0 | 0 | 0 | 119 | 55 | 7 | 616 | 9 | 58086 | 14.2326 | 46493 |
| 21-14.7379 | 69 | 196 | 364 | 7379 | 54 | 23 | 12 | 13 | 0 | 0 | 2 | 1 | 0 | 0 | 126 | 54 | 8 | 8 | 10 | 75434 | 14.2121 | 16832 |

k = 21, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-14.2 | 51 202 400 | 2 | 28 | 51 | 12 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 28 | 4 | 24 | 10484 | 1 | 14.1761 | 3 |
| 21-14.3 | 52 184 452 | 3 | 24 | 48 | 18 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 24 | 4 | 244 | 25188 | 2 | 14.1753 | 1 |
| 21-14.6 | 52 196 416 | 6 | 36 | 36 | 22 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 36 | 4 | 9 | 1156 | 3 | 14.1772 | 7 |
| 21-14.7 | 52 198 402 | 7 | 35 | 39 | 19 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 35 | 4 | 10 | 1882 | 4 | 14.1774 | 8 |
| 21-14.10 | 53 190 422 | 10 | 34 | 39 | 18 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 34 | 4 | 26 | 2365 | 5 | 14.1781 | 10 |
| 21-14.11 | 53 190 422 | 10 | 32 | 39 | 20 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 32 | 4 | 58 | 3933 | 6 | 14.1781 | 10 |
| 21-14.12 | 53 192 412 | 12 | 32 | 45 | 12 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 32 | 4 | 27 | 3934 | 7 | 14.1783 | 12 |
| 21-14.18 | 53 196 404 | 17 | 34 | 39 | 18 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 34 | 4 | 29 | 2367 | 8 | 14.1791 | 17 |

k = 21, Design generators

| Design | Design Generators | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-14.1 | 7 | 14 | 25 | 42 | 54 | 61 | 69 | 88 | 104 | 112 | 121 | 122 | 124 | 127 |
| 21-14.2 | 7 | 30 | 35 | 38 | 41 | 52 | 81 | 82 | 104 | 112 | 121 | 122 | 124 | 127 |
| 21-14.3 | 7 | 29 | 30 | 35 | 37 | 41 | 44 | 70 | 73 | 104 | 112 | 121 | 122 | 124 |
| 21-14.4 | 7 | 11 | 19 | 29 | 35 | 42 | 69 | 73 | 81 | 92 | 108 | 119 | 120 | 126 |
| 21-14.5 | 7 | 11 | 19 | 29 | 35 | 38 | 52 | 73 | 101 | 104 | 112 | 121 | 122 | 124 |
| 21-14.6 | 7 | 11 | 30 | 35 | 49 | 76 | 84 | 88 | 104 | 107 | 112 | 121 | 122 | 124 |
| 21-14.7 | 7 | 11 | 13 | 19 | 21 | 22 | 25 | 35 | 61 | 62 | 78 | 84 | 111 | 120 |
| 21-14.8 | 7 | 11 | 13 | 19 | 35 | 69 | 70 | 81 | 82 | 87 | 98 | 108 | 118 | 120 |
| 21-14.9 | 7 | 11 | 19 | 25 | 26 | 59 | 95 | 97 | 98 | 104 | 112 | 121 | 122 | 124 |
| 21-14.10 | 7 | 11 | 21 | 35 | 46 | 52 | 61 | 79 | 81 | 104 | 112 | 121 | 122 | 124 |
| 21-14.11 | 7 | 11 | 19 | 29 | 35 | 45 | 53 | 57 | 70 | 73 | 74 | 94 | 108 | 120 |
| 21-14.12 | 7 | 19 | 25 | 28 | 31 | 38 | 55 | 62 | 84 | 97 | 112 | 121 | 122 | 124 |
| 21-14.13 | 7 | 11 | 19 | 29 | 38 | 41 | 49 | 55 | 69 | 74 | 76 | 111 | 120 | 126 |
| 21-14.14 | 7 | 11 | 19 | 29 | 35 | 45 | 53 | 57 | 63 | 73 | 74 | 81 | 119 | 120 |
| 21-14.15 | 7 | 11 | 21 | 26 | 50 | 56 | 59 | 61 | 95 | 104 | 112 | 121 | 122 | 124 |
| 21-14.16 | 7 | 11 | 19 | 25 | 38 | 41 | 52 | 62 | 67 | 73 | 82 | 92 | 109 | 120 |
| 21-14.17 | 7 | 11 | 19 | 35 | 38 | 41 | 42 | 55 | 59 | 73 | 74 | 93 | 101 | 120 |
| 21-14.18 | 7 | 22 | 35 | 38 | 41 | 50 | 55 | 56 | 101 | 104 | 112 | 121 | 122 | 124 |
| 21-14.19 | 7 | 35 | 41 | 42 | 52 | 67 | 87 | 102 | 104 | 112 | 121 | 122 | 124 | 127 |
| 21-14.20 | 7 | 11 | 19 | 28 | 31 | 35 | 49 | 76 | 85 | 104 | 112 | 121 | 122 | 124 |
| 21-14.21 | 7 | 11 | 35 | 38 | 42 | 49 | 50 | 76 | 101 | 104 | 112 | 121 | 122 | 124 |
| 21-14.110 | 7 | 11 | 21 | 35 | 46 | 52 | 69 | 73 | 76 | 104 | 112 | 121 | 122 | 124 |
| 21-14.225 | 7 | 19 | 25 | 28 | 31 | 38 | 44 | 50 | 55 | 81 | 112 | 121 | 122 | 124 |
| 21-14.2560 | 7 | 11 | 19 | 29 | 38 | 41 | 55 | 67 | 74 | 76 | 84 | 109 | 118 | 120 |
| 21-14.7379 | 7 | 11 | 19 | 21 | 28 | 31 | 38 | 41 | 52 | 104 | 112 | 121 | 122 | 124 |
| 21-14.18122 | 7 | 11 | 19 | 29 | 38 | 41 | 60 | 69 | 90 | 95 | 111 | 119 | 120 | 123 |
| 21-14.23744 | 7 | 35 | 38 | 41 | 42 | 49 | 52 | 63 | 82 | 104 | 112 | 121 | 122 | 124 |
| 21-14.28450 | 7 | 19 | 25 | 26 | 28 | 38 | 52 | 79 | 81 | 109 | 112 | 121 | 122 | 124 |
| 21-14.29904 | 7 | 11 | 21 | 31 | 38 | 77 | 94 | 103 | 104 | 112 | 121 | 122 | 124 | 127 |
| 21-14.38737 | 7 | 11 | 25 | 26 | 31 | 41 | 53 | 91 | 104 | 112 | 115 | 121 | 122 | 124 |
| 21-14.41505 | 7 | 11 | 13 | 19 | 21 | 31 | 47 | 50 | 76 | 100 | 112 | 121 | 122 | 124 |
| 21-14.80683 | 7 | 19 | 25 | 28 | 41 | 50 | 63 | 73 | 82 | 93 | 112 | 121 | 122 | 124 |

k = 22, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-15.1 | 65 248 572 | 1 | 25 | 36 | 32 | 8 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 124 | 25 | 6 | 20 | 14585 | 942 | 12.8007 | 1 |
| 22-15.2 | 65 256 552 | 2 | 12 | 68 | 12 | 6 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 124 | 12 | 6 | 21 | 37076 | 943 | 12.8019 | 2 |
| 22-15.3 | 66 254 544 | 3 | 21 | 52 | 12 | 15 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 21 | 5 | 22 | 29981 | 1 | 12.8032 | 3 |
| 22-15.4 | 67 248 564 | 4 | 24 | 43 | 23 | 9 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 124 | 24 | 6 | 23 | 18713 | 944 | 12.8043 | 4 |
| 22-15.5 | 68 240 568 | 5 | 8 | 58 | 18 | 7 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 8 | 5 | 732 | 38218 | 2 | 12.8047 | 5 |
| 22-15.6 | 68 240 570 | 6 | 24 | 36 | 27 | 12 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 122 | 24 | 6 | 135 | 18714 | 945 | 12.8047 | 6 |
| 22-15.7 | 68 241 568 | 7 | 28 | 34 | 30 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 28 | 5 | 24 | 5514 | 3 | 12.8049 | 7 |
| 22-15.8 | 68 248 542 | 8 | 29 | 38 | 22 | 10 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 29 | 5 | 3 | 3996 | 4 | 12.8058 | 8 |
| 22-15.9 | 68 248 553 | 9 | 32 | 30 | 28 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 32 | 5 | 4 | 1549 | 5 | 12.8060 | 10 |
| 22-15.10 | 68 248 553 | 9 | 20 | 46 | 22 | 7 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 20 | 5 | 136 | 31744 | 6 | 12.8060 | 10 |
| 22-15.11 | 68 249 544 | 11 | 4 | 70 | 6 | 11 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 4 | 5 | 733 | 38644 | 7 | 12.8060 | 12 |
| 22-15.12 | 68 249 548 | 12 | 29 | 32 | 30 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 29 | 5 | 25 | 3997 | 8 | 12.8061 | 13 |
| 22-15.13 | 68 253 536 | 13 | 21 | 50 | 14 | 12 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 21 | 5 | 67 | 29982 | 9 | 12.8067 | 18 |
| 22-15.14 | 68 256 521 | 14 | 9 | 80 | 0 | 6 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 124 | 9 | 8 | 26 | 38114 | 30009 | 12.8070 | 21 |
| 22-15.15 | 68 256 530 | 15 | 17 | 54 | 16 | 7 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 17 | 5 | 137 | 34659 | 10 | 12.8072 | 26 |
| 22-15.16 | 69 236 578 | 16 | 28 | 40 | 15 | 17 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 28 | 5 | 27 | 5515 | 11 | 12.8060 | 9 |
| 22-15.17 | 69 240 552 | 17 | 17 | 45 | 24 | 10 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 120 | 17 | 6 | 389 | 34660 | 946 | 12.8063 | 14 |
| 22-15.18 | 69 240 562 | 18 | 25 | 36 | 25 | 11 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 25 | 5 | 138 | 14586 | 12 | 12.8065 | 16 |
| 22-15.19 | 69 240 562 | 19 | 30 | 32 | 26 | 12 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 124 | 30 | 6 | 28 | 3051 | 947 | 12.8065 | 15 |
| 22-15.20 | 69 242 548 | 20 | 17 | 46 | 22 | 10 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 120 | 17 | 6 | 390 | 34661 | 948 | 12.8066 | 17 |
| 22-15.21 | 69 242 558 | 21 | 32 | 33 | 22 | 13 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 32 | 5 | 5 | 1550 | 13 | 12.8068 | 19 |

k = 22, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-15.26 | 69 248 532 | 26 | 36 | 26 | 36 | 3 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 127 | 36 | 6 | 1 | 454 | 950 | 12.8075 | 30 |
| 22-15.4645 | 85 264 492 | 4645 | 48 | 17 | 24 | 12 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 127 | 48 | 8 | 2 | 1 | 30303 | 12.8406 | 17429 |
| 22-15.8 | 68 248 542 | 8 | 29 | 38 | 22 | 10 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 29 | 5 | 3 | 3996 | 4 | 12.8058 | 8 |
| 22-15.9 | 68 248 553 | 9 | 32 | 30 | 28 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 32 | 5 | 4 | 1549 | 5 | 12.8060 | 10 |
| 22-15.21 | 69 242 558 | 21 | 32 | 33 | 22 | 13 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 32 | 5 | 5 | 1550 | 13 | 12.8068 | 19 |
| 22-15.22 | 69 244 544 | 22 | 30 | 35 | 27 | 6 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 125 | 30 | 6 | 6 | 3052 | 949 | 12.8070 | 20 |
| 22-15.23 | 69 244 548 | 23 | 32 | 33 | 22 | 13 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 32 | 5 | 7 | 1551 | 14 | 12.8070 | 22 |
| 22-15.39 | 70 240 544 | 39 | 31 | 37 | 19 | 11 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 5 | 8 | 2409 | 24 | 12.8081 | 41 |
| 22-15.43 | 70 240 556 | 43 | 33 | 31 | 25 | 9 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 33 | 5 | 9 | 1134 | 27 | 12.8083 | 44 |
| 22-15.46 | 70 243 538 | 46 | 31 | 36 | 21 | 11 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 6 | 10 | 2411 | 958 | 12.8085 | 49 |

k = 22, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-15.4645 | 85 264 492 | 4645 | 48 | 17 | 24 | 12 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 127 | 48 | 8 | 2 | 1 | 30303 | 12.8406 | 17429 |
| 22-15.8501 | 89 210 546 | 8501 | 48 | 20 | 7 | 20 | 1 | 5 | 1 | 0 | 0 | 0 | 0 | 124 | 48 | 7 | 66 | 2 | 17314 | 12.8381 | 14609 |
| 22-15.29288 | 104 216 501 | 29288 | 48 | 24 | 14 | 0 | 0 | 14 | 0 | 0 | 1 | 0 | 0 | 123 | 48 | 9 | 132 | 3 | 37674 | 12.8672 | 35585 |
| 22-15.30203 | 105 194 514 | 30203 | 48 | 27 | 8 | 3 | 0 | 14 | 0 | 0 | 1 | 0 | 0 | 123 | 48 | 9 | 133 | 4 | 37728 | 12.8648 | 35134 |
| 22-15.30206 | 105 216 492 | 30206 | 48 | 27 | 8 | 3 | 0 | 14 | 0 | 0 | 1 | 0 | 0 | 123 | 48 | 9 | 134 | 5 | 37729 | 12.8690 | 35809 |

k = 22, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-15.3 | 66 254 544 | 3 | 21 | 52 | 12 | 15 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 21 | 5 | 22 | 29981 | 1 | 12.8032 | 3 |
| 22-15.5 | 68 240 568 | 5 | 8 | 58 | 18 | 7 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 8 | 5 | 732 | 38218 | 2 | 12.8047 | 5 |
| 22-15.7 | 68 241 568 | 7 | 28 | 34 | 30 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 28 | 5 | 24 | 5514 | 3 | 12.8049 | 7 |
| 22-15.8 | 68 248 542 | 8 | 29 | 38 | 22 | 10 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 29 | 5 | 3 | 3996 | 4 | 12.8058 | 8 |
| 22-15.9 | 68 248 553 | 9 | 32 | 30 | 28 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 32 | 5 | 4 | 1549 | 5 | 12.8060 | 10 |
| 22-15.10 | 68 248 553 | 9 | 20 | 46 | 22 | 7 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 20 | 5 | 136 | 31744 | 6 | 12.8060 | 10 |
| 22-15.11 | 68 249 544 | 11 | 4 | 70 | 6 | 11 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 4 | 5 | 733 | 38644 | 7 | 12.8060 | 12 |
| 22-15.12 | 68 249 548 | 12 | 29 | 32 | 30 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 29 | 5 | 25 | 3997 | 8 | 12.8061 | 13 |
| 22-15.13 | 68 253 536 | 13 | 21 | 50 | 14 | 12 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 21 | 5 | 67 | 29982 | 9 | 12.8067 | 18 |
| 22-15.15 | 68 256 530 | 15 | 17 | 54 | 16 | 7 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 17 | 5 | 137 | 34659 | 10 | 12.8072 | 26 |

k = 22, Design generators

| Design | Design Generators | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-15.1 | 7 | 11 | 19 | 29 | 37 | 41 | 55 | 59 | 74 | 82 | 84 | 102 | 108 | 120 | 126 |
| 22-15.2 | 7 | 11 | 19 | 30 | 38 | 41 | 52 | 61 | 74 | 87 | 93 | 101 | 111 | 114 | 120 |
| 22-15.3 | 7 | 11 | 19 | 30 | 38 | 41 | 59 | 61 | 74 | 85 | 92 | 98 | 111 | 118 | 120 |
| 22-15.4 | 7 | 11 | 19 | 29 | 37 | 41 | 47 | 49 | 55 | 69 | 91 | 94 | 99 | 120 | 125 |
| 22-15.5 | 7 | 11 | 19 | 41 | 52 | 62 | 73 | 82 | 84 | 94 | 99 | 101 | 111 | 113 | 120 |
| 22-15.6 | 7 | 11 | 19 | 38 | 41 | 50 | 60 | 63 | 69 | 91 | 93 | 106 | 117 | 118 | 120 |
| 22-15.7 | 7 | 11 | 19 | 29 | 38 | 41 | 60 | 70 | 76 | 82 | 99 | 109 | 117 | 118 | 120 |
| 22-15.8 | 7 | 11 | 19 | 22 | 38 | 41 | 60 | 67 | 78 | 82 | 95 | 109 | 113 | 119 | 120 |
| 22-15.9 | 7 | 11 | 21 | 28 | 38 | 57 | 76 | 83 | 90 | 95 | 101 | 111 | 118 | 120 | 123 |
| 22-15.10 | 7 | 11 | 19 | 29 | 37 | 41 | 47 | 59 | 77 | 78 | 84 | 91 | 102 | 119 | 120 |
| 22-15.11 | 7 | 11 | 19 | 29 | 37 | 41 | 50 | 60 | 63 | 69 | 73 | 82 | 99 | 102 | 120 |
| 22-15.12 | 7 | 11 | 19 | 29 | 30 | 38 | 41 | 49 | 60 | 78 | 82 | 95 | 109 | 119 | 120 |
| 22-15.13 | 7 | 11 | 21 | 28 | 38 | 57 | 63 | 76 | 83 | 90 | 95 | 111 | 118 | 120 | 123 |
| 22-15.14 | 7 | 11 | 19 | 29 | 35 | 45 | 52 | 55 | 67 | 73 | 74 | 86 | 108 | 114 | 120 |
| 22-15.15 | 7 | 11 | 21 | 28 | 38 | 57 | 63 | 69 | 76 | 83 | 90 | 95 | 111 | 118 | 120 |
| 22-15.16 | 7 | 11 | 19 | 38 | 57 | 60 | 70 | 73 | 76 | 84 | 93 | 99 | 110 | 118 | 120 |
| 22-15.17 | 7 | 11 | 19 | 29 | 37 | 41 | 50 | 60 | 69 | 73 | 82 | 95 | 102 | 120 | 126 |
| 22-15.18 | 7 | 11 | 19 | 38 | 41 | 55 | 59 | 73 | 76 | 85 | 86 | 91 | 103 | 113 | 120 |
| 22-15.19 | 7 | 11 | 19 | 29 | 37 | 41 | 49 | 59 | 77 | 78 | 84 | 87 | 99 | 106 | 120 |
| 22-15.20 | 7 | 11 | 19 | 29 | 35 | 45 | 53 | 73 | 79 | 81 | 87 | 103 | 118 | 120 | 123 |
| 22-15.21 | 7 | 11 | 19 | 29 | 38 | 41 | 50 | 55 | 73 | 85 | 92 | 106 | 108 | 118 | 120 |
| 22-15.22 | 7 | 11 | 13 | 19 | 22 | 38 | 57 | 60 | 73 | 85 | 92 | 99 | 106 | 118 | 120 |
| 22-15.23 | 7 | 11 | 19 | 29 | 38 | 41 | 50 | 55 | 73 | 85 | 92 | 99 | 108 | 118 | 120 |
| 22-15.26 | 7 | 11 | 19 | 29 | 38 | 41 | 55 | 62 | 67 | 73 | 87 | 108 | 114 | 120 | 123 |
| 22-15.39 | 7 | 11 | 19 | 29 | 35 | 45 | 53 | 59 | 70 | 73 | 81 | 87 | 103 | 120 | 126 |
| 22-15.43 | 7 | 11 | 19 | 29 | 37 | 41 | 49 | 55 | 59 | 70 | 87 | 89 | 90 | 116 | 120 |
| 22-15.46 | 7 | 11 | 13 | 21 | 28 | 38 | 42 | 57 | 76 | 83 | 90 | 97 | 111 | 118 | 120 |
| 22-15.4645 | 7 | 11 | 19 | 29 | 30 | 35 | 41 | 42 | 44 | 47 | 53 | 59 | 78 | 118 | 120 |
| 22-15.8501 | 7 | 11 | 19 | 29 | 38 | 41 | 47 | 70 | 73 | 79 | 99 | 109 | 110 | 117 | 120 |
| 22-15.29288 | 7 | 11 | 19 | 21 | 22 | 25 | 26 | 28 | 31 | 35 | 45 | 46 | 77 | 118 | 120 |
| 22-15.30203 | 7 | 11 | 19 | 21 | 22 | 25 | 26 | 28 | 31 | 35 | 45 | 67 | 77 | 118 | 120 |
| 22-15.30206 | 7 | 11 | 19 | 21 | 22 | 25 | 26 | 28 | 31 | 35 | 45 | 46 | 77 | 117 | 120 |

k = 23, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23-16.1 | 83 316 744 | 1 | 12 | 52 | 24 | 9 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 125 | 12 | 7 | 10 | 32307 | 5495 | 11.5703 | 1 |
| 23-16.2 | 83 318 734 | 2 | 14 | 54 | 11 | 17 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 14 | 5 | 11 | 31330 | 1 | 11.5704 | 2 |
| 23-16.3 | 84 312 744 | 3 | 0 | 58 | 26 | 1 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 0 | 5 | 472 | 34743 | 2 | 11.5713 | 3 |
| 23-16.4 | 84 319 726 | 4 | 12 | 54 | 16 | 10 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 12 | 5 | 51 | 32308 | 3 | 11.5722 | 6 |
| 23-16.5 | 85 304 744 | 5 | 9 | 49 | 20 | 16 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 121 | 9 | 6 | 249 | 33463 | 61 | 11.5716 | 4 |
| 23-16.6 | 85 306 756 | 6 | 25 | 26 | 34 | 12 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 125 | 25 | 6 | 12 | 9682 | 62 | 11.5721 | 5 |
| 23-16.7 | 85 312 730 | 7 | 22 | 38 | 26 | 9 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 126 | 22 | 6 | 1 | 22091 | 63 | 11.5727 | 8 |
| 23-16.8 | 85 318 718 | 8 | 17 | 44 | 26 | 8 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 125 | 17 | 6 | 13 | 29653 | 64 | 11.5736 | 15 |
| 23-16.9 | 86 299 766 | 9 | 20 | 32 | 29 | 14 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 123 | 20 | 6 | 95 | 26421 | 65 | 11.5727 | 7 |
| 23-16.10 | 86 304 753 | 10 | 18 | 37 | 27 | 10 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 18 | 5 | 96 | 28456 | 4 | 11.5734 | 13 |
| 23-16.11 | 86 305 740 | 11 | 4 | 53 | 23 | 6 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 4 | 5 | 473 | 34497 | 5 | 11.5734 | 10 |
| 23-16.12 | 86 305 740 | 12 | 6 | 46 | 31 | 4 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 119 | 6 | 6 | 474 | 34227 | 66 | 11.5734 | 10 |
| 23-16.13 | 86 305 740 | 13 | 0 | 64 | 13 | 10 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 119 | 0 | 6 | 475 | 34744 | 67 | 11.5734 | 10 |
| 23-16.14 | 86 306 735 | 14 | 10 | 48 | 21 | 12 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 121 | 10 | 6 | 250 | 32981 | 68 | 11.5735 | 14 |
| 23-16.15 | 86 308 728 | 15 | 23 | 35 | 30 | 8 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 23 | 6 | 2 | 18285 | 69 | 11.5737 | 16 |
| 23-16.16 | 86 320 697 | 16 | 7 | 66 | 16 | 6 | 2 | 4 | 0 | 1 | 0 | 0 | 0 | 125 | 7 | 8 | 14 | 34110 | 20195 | 11.5753 | 26 |
| 23-16.17 | 86 324 696 | 17 | 13 | 45 | 36 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 124 | 13 | 6 | 52 | 32028 | 70 | 11.5760 | 31 |
| 23-16.18 | 87 290 790 | 18 | 22 | 42 | 11 | 21 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 22 | 5 | 15 | 22092 | 6 | 11.5732 | 9 |

k = 23, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23-16.7 | 85 312 730 | 7 | 22 | 38 | 26 | 9 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 126 | 22 | 6 | 1 | 22091 | 63 | 11.5727 | 8 |
| 23-16.15 | 86 308 728 | 15 | 23 | 35 | 30 | 8 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 23 | 6 | 2 | 18285 | 69 | 11.5737 | 16 |
| 23-16.21 | 87 300 754 | 21 | 26 | 31 | 29 | 8 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 126 | 26 | 6 | 3 | 6412 | 73 | 11.5744 | 21 |
| 23-16.29 | 88 300 745 | 29 | 28 | 30 | 21 | 21 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 28 | 6 | 4 | 2668 | 76 | 11.5759 | 30 |
| 23-16.31 | 88 305 724 | 31 | 24 | 38 | 21 | 12 | 7 | 0 | 1 | 0 | 0 | 0 | 0 | 126 | 24 | 7 | 5 | 13130 | 5497 | 11.5765 | 39 |
| 23-16.47 | 89 298 728 | 47 | 26 | 35 | 22 | 11 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 126 | 26 | 6 | 6 | 6415 | 91 | 11.5770 | 49 |
| 23-16.123 | 92 292 725 | 123 | 30 | 33 | 11 | 25 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 126 | 30 | 6 | 7 | 1289 | 145 | 11.5810 | 155 |
| 23-16.124 | 92 300 717 | 124 | 27 | 31 | 29 | 10 | 1 | 4 | 0 | 1 | 0 | 0 | 0 | 126 | 27 | 8 | 8 | 4520 | 20200 | 11.5823 | 231 |
| 23-16.537 | 97 270 776 | 537 | 36 | 27 | 8 | 25 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 126 | 36 | 6 | 9 | 208 | 338 | 11.5863 | 646 |
| 23-16.1 | 83 316 744 | 1 | 12 | 52 | 24 | 9 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 125 | 12 | 7 | 10 | 32307 | 5495 | 11.5703 | 1 |

k = 23, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23-16.9896 | 115 244 740 | 9896 | 45 | 6 | 27 | 4 | 15 | 0 | 0 | 3 | 0 | 0 | 0 | 123 | 45 | 8 | 189 | 1 | 23298 | 11.6118 | 18586 |
| 23-16.32406 | 140 140 1109 | 32406 | 44 | 18 | 0 | 1 | 12 | 17 | 1 | 0 | 0 | 0 | 0 | 116 | 44 | 7 | 3056 | 2 | 19930 | 11.6418 | 32819 |
| 23-16.32595 | 141 138 1102 | 32595 | 44 | 18 | 0 | 2 | 12 | 14 | 3 | 0 | 0 | 0 | 0 | 116 | 44 | 7 | 3057 | 3 | 19948 | 11.6430 | 32929 |
| 23-16.32597 | 141 138 1104 | 32597 | 44 | 18 | 0 | 0 | 17 | 11 | 2 | 1 | 0 | 0 | 0 | 116 | 44 | 8 | 3058 | 4 | 29387 | 11.6431 | 32933 |
| 23-16.32747 | 142 138 1095 | 32747 | 44 | 18 | 0 | 5 | 6 | 17 | 3 | 0 | 0 | 0 | 0 | 116 | 44 | 7 | 3059 | 5 | 19968 | 11.6446 | 33033 |
| 23-16.32751 | 142 138 1095 | 32751 | 44 | 18 | 0 | 3 | 12 | 11 | 5 | 0 | 0 | 0 | 0 | 116 | 44 | 7 | 3060 | 6 | 19972 | 11.6446 | 33036 |

k = 23, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,...) | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23-16.2 | 83 318 734 | 2 | 14 | 54 | 11 | 17 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 14 | 5 | 11 | 31330 | 1 | 11.5704 | 2 |
| 23-16.3 | 84 312 744 | 3 | 0 | 58 | 26 | 1 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 0 | 5 | 472 | 34743 | 2 | 11.5713 | 3 |
| 23-16.4 | 84 319 726 | 4 | 12 | 54 | 16 | 10 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 12 | 5 | 51 | 32308 | 3 | 11.5722 | 6 |
| 23-16.10 | 86 304 753 | 10 | 18 | 37 | 27 | 10 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 18 | 5 | 96 | 28456 | 4 | 11.5734 | 13 |
| 23-16.11 | 86 305 740 | 11 | 4 | 53 | 23 | 6 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 4 | 5 | 473 | 34497 | 5 | 11.5734 | 10 |
| 23-16.18 | 87 290 790 | 18 | 22 | 42 | 11 | 21 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 22 | 5 | 15 | 22092 | 6 | 11.5732 | 9 |
| 23-16.22 | 87 304 750 | 22 | 22 | 42 | 11 | 21 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 22 | 5 | 17 | 22093 | 7 | 11.5750 | 24 |
| 23-16.24 | 88 284 820 | 24 | 24 | 28 | 24 | 19 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 24 | 5 | 97 | 13127 | 8 | 11.5742 | 18 |

k = 23, Design generators

| Design | Design Generators | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23-16.1 | 7 | 11 | 19 | 25 | 26 | 31 | 35 | 45 | 46 | 77 | 81 | 92 | 100 | 106 | 118 | 120 |
| 23-16.2 | 7 | 11 | 19 | 30 | 38 | 57 | 60 | 70 | 73 | 76 | 84 | 93 | 99 | 110 | 118 | 120 |
| 23-16.3 | 7 | 11 | 19 | 29 | 37 | 59 | 62 | 73 | 87 | 94 | 99 | 106 | 111 | 117 | 118 | 120 |
| 23-16.4 | 7 | 11 | 19 | 29 | 41 | 47 | 49 | 59 | 62 | 77 | 82 | 92 | 97 | 110 | 116 | 120 |
| 23-16.5 | 7 | 11 | 19 | 29 | 35 | 46 | 53 | 57 | 73 | 76 | 82 | 100 | 109 | 118 | 120 | 123 |
| 23-16.6 | 7 | 11 | 19 | 29 | 37 | 41 | 47 | 55 | 59 | 74 | 82 | 84 | 102 | 108 | 120 | 126 |
| 23-16.7 | 7 | 11 | 19 | 29 | 37 | 41 | 49 | 55 | 59 | 70 | 76 | 87 | 89 | 90 | 116 | 120 |
| 23-16.8 | 7 | 11 | 19 | 29 | 37 | 38 | 41 | 50 | 60 | 63 | 69 | 73 | 91 | 106 | 113 | 120 |
| 23-16.9 | 7 | 11 | 21 | 26 | 28 | 38 | 57 | 63 | 73 | 82 | 95 | 99 | 110 | 119 | 120 | 125 |
| 23-16.10 | 7 | 11 | 19 | 29 | 37 | 41 | 47 | 59 | 77 | 78 | 84 | 91 | 99 | 102 | 119 | 120 |
| 23-16.11 | 7 | 11 | 19 | 29 | 37 | 41 | 50 | 60 | 63 | 69 | 73 | 82 | 99 | 102 | 106 | 120 |
| 23-16.12 | 7 | 11 | 19 | 29 | 37 | 41 | 55 | 59 | 77 | 78 | 82 | 87 | 91 | 99 | 116 | 120 |
| 23-16.13 | 7 | 11 | 19 | 22 | 35 | 38 | 57 | 60 | 63 | 73 | 87 | 93 | 103 | 109 | 114 | 120 |
| 23-16.14 | 7 | 11 | 19 | 29 | 37 | 41 | 47 | 55 | 59 | 82 | 99 | 109 | 110 | 113 | 116 | 120 |
| 23-16.15 | 7 | 11 | 19 | 29 | 30 | 38 | 41 | 47 | 70 | 84 | 89 | 90 | 99 | 106 | 108 | 120 |
| 23-16.16 | 7 | 11 | 19 | 25 | 26 | 35 | 45 | 53 | 67 | 78 | 86 | 92 | 100 | 103 | 106 | 120 |
| 23-16.17 | 7 | 11 | 19 | 29 | 35 | 37 | 41 | 50 | 60 | 63 | 73 | 87 | 94 | 102 | 111 | 120 |
| 23-16.18 | 7 | 11 | 19 | 38 | 57 | 60 | 70 | 73 | 76 | 81 | 84 | 93 | 99 | 110 | 118 | 120 |
| 23-16.21 | 7 | 11 | 19 | 29 | 37 | 41 | 49 | 55 | 59 | 70 | 87 | 89 | 90 | 106 | 116 | 120 |
| 23-16.22 | 7 | 11 | 19 | 29 | 37 | 41 | 47 | 49 | 55 | 62 | 77 | 82 | 92 | 97 | 116 | 120 |
| 23-16.24 | 7 | 11 | 19 | 30 | 38 | 41 | 44 | 49 | 59 | 69 | 76 | 93 | 97 | 111 | 117 | 120 |
| 23-16.29 | 7 | 11 | 21 | 28 | 38 | 42 | 57 | 76 | 83 | 90 | 95 | 101 | 111 | 118 | 120 | 123 |
| 23-16.31 | 7 | 11 | 19 | 29 | 37 | 41 | 59 | 73 | 76 | 79 | 85 | 91 | 99 | 109 | 113 | 120 |
| 23-16.47 | 7 | 11 | 19 | 29 | 37 | 41 | 50 | 59 | 73 | 76 | 79 | 85 | 99 | 109 | 113 | 120 |
| 23-16.123 | 7 | 11 | 19 | 29 | 35 | 37 | 41 | 55 | 73 | 74 | 76 | 82 | 94 | 102 | 116 | 120 |
| 23-16.124 | 7 | 11 | 19 | 25 | 26 | 28 | 35 | 45 | 53 | 54 | 67 | 73 | 86 | 103 | 114 | 120 |
| 23-16.537 | 7 | 11 | 19 | 29 | 35 | 37 | 41 | 55 | 59 | 73 | 74 | 76 | 82 | 94 | 102 | 120 |
| 23-16.9896 | 7 | 11 | 13 | 14 | 19 | 25 | 26 | 31 | 35 | 41 | 53 | 67 | 73 | 85 | 100 | 120 |
| 23-16.32406 | 7 | 11 | 13 | 14 | 19 | 21 | 38 | 41 | 44 | 50 | 55 | 61 | 62 | 93 | 101 | 120 |
| 23-16.32595 | 7 | 11 | 13 | 19 | 21 | 25 | 26 | 35 | 38 | 41 | 44 | 50 | 55 | 93 | 101 | 120 |
| 23-16.32597 | 7 | 11 | 13 | 19 | 25 | 26 | 28 | 35 | 41 | 44 | 47 | 61 | 62 | 78 | 118 | 120 |
| 23-16.32747 | 7 | 11 | 13 | 14 | 19 | 25 | 28 | 54 | 86 | 104 | 110 | 117 | 121 | 122 | 124 | 127 |
| 23-16.32751 | 7 | 11 | 13 | 19 | 21 | 25 | 35 | 38 | 41 | 44 | 47 | 50 | 55 | 93 | 101 | 120 |

k = 24, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24-17.1 | 102 384 992 | 1 | 0 | 54 | 16 | 24 | 0 | 4 | 0 | 0 | 0 | 0 | 122 | 0 | 6 | 120 | 27865 | 4 | 10.4617 | 1 |
| 24-17.2 | 102 394 985 | 2 | 7 | 57 | 9 | 17 | 12 | 0 | 0 | 0 | 0 | 0 | 126 | 7 | 5 | 7 | 26967 | 1 | 10.4631 | 2 |
| 24-17.3 | 103 393 972 | 3 | 14 | 39 | 31 | 7 | 9 | 3 | 0 | 0 | 0 | 0 | 127 | 14 | 6 | 1 | 24313 | 5 | 10.4643 | 3 |
| 24-17.4 | 104 392 960 | 4 | 15 | 36 | 33 | 12 | 0 | 7 | 0 | 0 | 0 | 0 | 127 | 15 | 6 | 2 | 24068 | 6 | 10.4655 | 7 |
| 24-17.5 | 105 372 1026 | 5 | 15 | 29 | 32 | 15 | 7 | 2 | 0 | 0 | 0 | 0 | 124 | 15 | 6 | 54 | 24069 | 7 | 10.4648 | 4 |
| 24-17.6 | 105 374 1008 | 6 | 3 | 37 | 40 | 3 | 11 | 2 | 0 | 0 | 0 | 0 | 120 | 3 | 6 | 248 | 27675 | 8 | 10.4649 | 5 |
| 24-17.7 | 105 378 988 | 7 | 5 | 45 | 24 | 13 | 9 | 2 | 0 | 0 | 0 | 0 | 122 | 5 | 6 | 121 | 27306 | 9 | 10.4653 | 6 |
| 24-17.8 | 105 400 930 | 8 | 4 | 53 | 32 | 6 | 0 | 4 | 2 | 1 | 0 | 0 | 126 | 4 | 8 | 8 | 27392 | 10050 | 10.4679 | 11 |
| 24-17.9 | 105 405 928 | 9 | 8 | 42 | 42 | 3 | 0 | 3 | 4 | 0 | 0 | 0 | 126 | 8 | 7 | 9 | 26390 | 1118 | 10.4687 | 15 |
| 24-17.10 | 106 374 1000 | 10 | 0 | 47 | 29 | 9 | 7 | 4 | 0 | 0 | 0 | 0 | 120 | 0 | 6 | 249 | 27866 | 10 | 10.4663 | 8 |
| 24-17.11 | 107 370 994 | 11 | 9 | 38 | 27 | 12 | 10 | 2 | 0 | 0 | 0 | 0 | 122 | 9 | 6 | 122 | 26199 | 11 | 10.4671 | 10 |
| 24-17.12 | 107 380 988 | 12 | 12 | 48 | 12 | 24 | 3 | 0 | 3 | 0 | 0 | 0 | 126 | 12 | 7 | 10 | 25053 | 1119 | 10.4686 | 14 |
| 24-17.13 | 108 352 1072 | 13 | 16 | 48 | 0 | 26 | 12 | 0 | 0 | 0 | 0 | 0 | 126 | 16 | 5 | 11 | 22970 | 2 | 10.4668 | 9 |
| 24-17.14 | 108 367 996 | 14 | 0 | 53 | 18 | 12 | 10 | 3 | 0 | 0 | 0 | 0 | 120 | 0 | 6 | 250 | 27867 | 12 | 10.4682 | 12 |
| 24-17.15 | 108 370 987 | 15 | 10 | 37 | 28 | 8 | 14 | 1 | 0 | 0 | 0 | 0 | 122 | 10 | 6 | 123 | 25868 | 13 | 10.4686 | 13 |
| 24-17.16 | 108 373 1012 | 16 | 16 | 48 | 0 | 26 | 12 | 0 | 0 | 0 | 0 | 0 | 126 | 16 | 5 | 12 | 22971 | 3 | 10.4693 | 18 |
| 24-17.17 | 109 363 1000 | 17 | 13 | 31 | 29 | 14 | 8 | 3 | 0 | 0 | 0 | 0 | 122 | 13 | 6 | 124 | 24822 | 14 | 10.4692 | 16 |
| 24-17.18 | 109 366 1006 | 18 | 17 | 30 | 28 | 13 | 9 | 3 | 0 | 0 | 0 | 0 | 124 | 17 | 6 | 55 | 22403 | 15 | 10.4697 | 22 |
| 24-17.19 | 109 367 988 | 19 | 4 | 43 | 26 | 11 | 8 | 4 | 0 | 0 | 0 | 0 | 120 | 4 | 6 | 253 | 27393 | 16 | 10.4696 | 19 |
| 24-17.20 | 109 367 988 | 19 | 3 | 44 | 27 | 11 | 7 | 3 | 1 | 0 | 0 | 0 | 120 | 3 | 7 | 251 | 27676 | 1120 | 10.4696 | 19 |

k = 24, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24-17.3 | 103 | 393 | 972 | 3 | 14 | 39 | 31 | 7 | 9 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 14 | 6 | 1 | 24313 | 5 | 10.4643 | 3 |
| 24-17.4 | 104 | 392 | 960 | 4 | 15 | 36 | 33 | 12 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 15 | 6 | 2 | 24068 | 6 | 10.4655 | 7 |
| 24-17.22 | 109 | 373 | 968 | 22 | 20 | 34 | 25 | 12 | 8 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 127 | 20 | 7 | 3 | 19896 | 1122 | 10.4703 | 25 |
| 24-17.35 | 111 | 364 | 996 | 35 | 24 | 30 | 16 | 27 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 127 | 24 | 7 | 4 | 9940 | 1126 | 10.4723 | 45 |
| 24-17.91 | 115 | 356 | 972 | 91 | 24 | 39 | 0 | 33 | 3 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 127 | 24 | 7 | 5 | 9941 | 1157 | 10.4768 | 133 |
| 24-17.94 | 115 | 364 | 964 | 94 | 24 | 26 | 32 | 11 | 4 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 127 | 24 | 9 | 6 | 9943 | 20625 | 10.4779 | 178 |
| 24-17.2 | 102 | 394 | 985 | 2 | 7 | 57 | 9 | 17 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 7 | 5 | 7 | 26967 | 1 | 10.4631 | 2 |
| 24-17.8 | 105 | 400 | 930 | 8 | 4 | 53 | 32 | 6 | 0 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 126 | 4 | 8 | 8 | 27392 | 10050 | 10.4679 | 11 |
| 24-17.9 | 105 | 405 | 928 | 9 | 8 | 42 | 42 | 3 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 126 | 8 | 7 | 9 | 26390 | 1118 | 10.4687 | 15 |
| 24-17.12 | 107 | 380 | 988 | 12 | 12 | 48 | 12 | 24 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 12 | 7 | 10 | 25053 | 1119 | 10.4686 | 14 |

k = 24, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24-17.28100 | 250 | 54 | 2304 | 28100 | 45 | 0 | 0 | 0 | 0 | 1 | 15 | 15 | 0 | 0 | 100 | 45 | 8 | 28068 | 1 | 20624 | 10.6570 | 28100 |
| 24-17.28101a | 251 | 53 | 2296 | 28101 | 45 | 0 | 0 | 0 | 0 | 1 | 17 | 12 | 0 | 1 | 100 | 45 | 10 | 28069 | 2 | 27802 | 10.6583 | 28101 |
| 24-17.28101b | 251 | 53 | 2296 | 28101 | 45 | 0 | 0 | 0 | 0 | 2 | 15 | 12 | 2 | 0 | 100 | 45 | 9 | 28069 | 2 | 26133 | 10.6583 | 28101 |
| 24-17.28101c | 251 | 53 | 2296 | 28101 | 45 | 0 | 0 | 0 | 0 | 2 | 15 | 12 | 2 | 0 | 100 | 45 | 9 | 28069 | 2 | 26133 | 10.6583 | 28101 |
| 24-17.28104 | 251 | 54 | 2296 | 28104 | 45 | 0 | 0 | 0 | 0 | 2 | 15 | 12 | 2 | 0 | 100 | 45 | 9 | 28072 | 5 | 26135 | 10.6584 | 28104 |
| 24-17.28105 | 251 | 55 | 2296 | 28105 | 45 | 0 | 0 | 0 | 0 | 2 | 15 | 12 | 2 | 0 | 100 | 45 | 9 | 28073 | 6 | 26136 | 10.6586 | 28105 |
| 24-17.28106 | 251 | 56 | 2296 | 28106 | 45 | 0 | 0 | 0 | 0 | 1 | 17 | 12 | 0 | 1 | 100 | 45 | 10 | 28074 | 7 | 27803 | 10.6588 | 28106 |
| 24-17.28107 | 252 | 52 | 2288 | 28107 | 45 | 0 | 0 | 0 | 0 | 4 | 12 | 12 | 3 | 0 | 100 | 45 | 9 | 28075 | 8 | 26137 | 10.6595 | 28107 |

k = 24, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24-17.2 | 102 | 394 | 985 | 2 | 7 | 57 | 9 | 17 | 12 | 0 | 0 | 0 | 0 | 126 | 7 | 5 | 7 | 26967 | 1 | 10.4631 | 2 |
| 24-17.13 | 108 | 352 | 1072 | 13 | 16 | 48 | 0 | 26 | 12 | 0 | 0 | 0 | 0 | 126 | 16 | 5 | 11 | 22970 | 2 | 10.4668 | 9 |
| 24-17.16 | 108 | 373 | 1012 | 16 | 16 | 48 | 0 | 26 | 12 | 0 | 0 | 0 | 0 | 126 | 16 | 5 | 12 | 22971 | 3 | 10.4693 | 18 |
| 24-17.1 | 102 | 384 | 992 | 1 | 0 | 54 | 16 | 24 | 0 | 4 | 0 | 0 | 0 | 122 | 0 | 6 | 120 | 27865 | 4 | 10.4617 | 1 |
| 24-17.3 | 103 | 393 | 972 | 3 | 14 | 39 | 31 | 7 | 9 | 3 | 0 | 0 | 0 | 127 | 14 | 6 | 1 | 24313 | 5 | 10.4643 | 3 |
| 24-17.4 | 104 | 392 | 960 | 4 | 15 | 36 | 33 | 12 | 0 | 7 | 0 | 0 | 0 | 127 | 15 | 6 | 2 | 24068 | 6 | 10.4655 | 7 |
| 24-17.5 | 105 | 372 | 1026 | 5 | 15 | 29 | 32 | 15 | 7 | 2 | 0 | 0 | 0 | 124 | 15 | 6 | 54 | 24069 | 7 | 10.4648 | 4 |
| 24-17.6 | 105 | 374 | 1008 | 6 | 3 | 37 | 40 | 3 | 11 | 2 | 0 | 0 | 0 | 120 | 3 | 6 | 248 | 27675 | 8 | 10.4649 | 5 |
| 24-17.7 | 105 | 378 | 988 | 7 | 5 | 45 | 24 | 13 | 9 | 2 | 0 | 0 | 0 | 122 | 5 | 6 | 121 | 27306 | 9 | 10.4653 | 6 |
| 24-17.10 | 106 | 374 | 1000 | 10 | 0 | 47 | 29 | 9 | 7 | 4 | 0 | 0 | 0 | 120 | 0 | 6 | 249 | 27866 | 10 | 10.4663 | 8 |

k = 24, Design generators

| Design | Design Generators | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24-17.1 | 7 | 11 | 19 | 29 | 35 | 46 | 53 | 57 | 73 | 76 | 82 | 87 | 100 | 109 | 118 | 120 | 123 |
| 24-17.2 | 7 | 11 | 19 | 30 | 38 | 57 | 60 | 70 | 73 | 76 | 81 | 84 | 93 | 99 | 110 | 118 | 120 |
| 24-17.3 | 7 | 11 | 19 | 29 | 41 | 47 | 49 | 59 | 62 | 77 | 82 | 92 | 97 | 110 | 116 | 119 | 120 |
| 24-17.4 | 7 | 11 | 19 | 29 | 37 | 38 | 41 | 50 | 60 | 63 | 69 | 73 | 82 | 91 | 106 | 113 | 120 |
| 24-17.5 | 7 | 11 | 21 | 26 | 28 | 38 | 57 | 63 | 73 | 76 | 82 | 95 | 99 | 110 | 119 | 120 | 125 |
| 24-17.6 | 7 | 11 | 19 | 29 | 35 | 53 | 57 | 73 | 76 | 82 | 94 | 98 | 100 | 109 | 118 | 120 | 123 |
| 24-17.7 | 7 | 11 | 19 | 29 | 35 | 46 | 53 | 57 | 73 | 76 | 82 | 94 | 100 | 109 | 118 | 120 | 123 |
| 24-17.8 | 7 | 11 | 19 | 25 | 26 | 35 | 45 | 53 | 63 | 67 | 78 | 86 | 92 | 100 | 103 | 106 | 120 |
| 24-17.9 | 7 | 11 | 19 | 29 | 35 | 37 | 41 | 50 | 60 | 63 | 73 | 87 | 94 | 102 | 111 | 113 | 120 |
| 24-17.10 | 7 | 11 | 19 | 29 | 37 | 41 | 59 | 62 | 73 | 82 | 87 | 99 | 106 | 111 | 117 | 118 | 120 |
| 24-17.11 | 7 | 11 | 19 | 29 | 38 | 41 | 44 | 55 | 62 | 69 | 76 | 89 | 90 | 98 | 111 | 120 | 125 |
| 24-17.12 | 7 | 11 | 19 | 30 | 38 | 41 | 44 | 49 | 52 | 61 | 74 | 87 | 93 | 101 | 111 | 114 | 120 |
| 24-17.13 | 7 | 11 | 19 | 38 | 57 | 60 | 70 | 73 | 76 | 81 | 84 | 91 | 93 | 99 | 110 | 118 | 120 |
| 24-17.14 | 7 | 11 | 19 | 21 | 38 | 41 | 52 | 62 | 69 | 79 | 87 | 89 | 100 | 106 | 114 | 120 | 125 |
| 24-17.15 | 7 | 11 | 19 | 29 | 37 | 41 | 47 | 55 | 59 | 62 | 82 | 99 | 109 | 110 | 113 | 116 | 120 |
| 24-17.16 | 7 | 11 | 19 | 29 | 37 | 41 | 47 | 49 | 55 | 59 | 62 | 77 | 78 | 82 | 84 | 91 | 120 |
| 24-17.17 | 7 | 11 | 19 | 29 | 37 | 41 | 49 | 55 | 59 | 62 | 77 | 78 | 91 | 97 | 98 | 111 | 120 |
| 24-17.18 | 7 | 11 | 19 | 29 | 37 | 41 | 47 | 49 | 59 | 62 | 69 | 84 | 89 | 90 | 99 | 102 | 120 |
| 24-17.19 | 7 | 11 | 19 | 29 | 37 | 41 | 44 | 62 | 73 | 76 | 87 | 99 | 106 | 111 | 117 | 118 | 120 |
| 24-17.20 | 7 | 11 | 19 | 29 | 35 | 44 | 53 | 57 | 73 | 76 | 82 | 94 | 100 | 109 | 118 | 120 | 123 |
| 24-17.22 | 7 | 11 | 19 | 29 | 37 | 38 | 41 | 50 | 60 | 63 | 69 | 73 | 76 | 82 | 91 | 113 | 120 |
| 24-17.35 | 7 | 11 | 21 | 28 | 38 | 42 | 57 | 76 | 83 | 90 | 95 | 101 | 105 | 111 | 118 | 120 | 123 |
| 24-17.91 | 7 | 11 | 19 | 29 | 35 | 37 | 41 | 55 | 59 | 73 | 74 | 76 | 82 | 94 | 102 | 116 | 120 |
| 24-17.94 | 7 | 11 | 19 | 25 | 26 | 35 | 41 | 53 | 54 | 59 | 69 | 70 | 82 | 106 | 116 | 119 | 120 |
| 24-17.28100 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 67 | 69 | 81 | 87 | 92 | 100 | 103 | 112 | 117 |
| 24-17.28101a | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 55 | 67 | 81 | 84 | 95 | 100 | 103 | 112 | 117 |
| 24-17.28101b | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 50 | 67 | 70 | 81 | 84 | 95 | 97 | 100 | 112 |
| 24-17.28101c | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 67 | 69 | 81 | 82 | 87 | 97 | 111 | 112 | 118 |
| 24-17.28104 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 55 | 67 | 69 | 81 | 84 | 95 | 100 | 103 | 112 |
| 24-17.28105 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 67 | 81 | 87 | 92 | 100 | 103 | 112 | 115 | 117 |
| 24-17.28106 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 67 | 81 | 82 | 87 | 92 | 100 | 103 | 112 | 115 |
| 24-17.28107 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 63 | 67 | 81 | 82 | 84 | 87 | 97 | 112 | 117 |

k = 25, Designs sorted based on word length pattern

| Design | wlp($w_4$,...) | wlp rank | alp | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25-18.1 | 124 482 1312 | 1 | 0 | 64 | 0 | 18 | 20 | 0 | 0 | 0 | 0 | 127 | 0 | 5 | 1 | 20240 | 1 | 9.4697 | 1 |
| 25-18.2 | 125 504 1222 | 2 | 0 | 41 | 48 | 6 | 0 | 0 | 6 | 1 | 0 | 127 | 0 | 8 | 2 | 20241 | 3424 | 9.4730 | 3 |
| 25-18.3 | 126 468 1304 | 3 | 0 | 42 | 28 | 12 | 12 | 4 | 0 | 0 | 0 | 123 | 0 | 6 | 45 | 20242 | 2 | 9.4704 | 2 |
| 25-18.4 | 129 458 1310 | 4 | 5 | 33 | 34 | 7 | 15 | 4 | 0 | 0 | 0 | 123 | 5 | 6 | 46 | 19619 | 3 | 9.4732 | 4 |
| 25-18.5 | 130 449 1341 | 5 | 0 | 36 | 33 | 14 | 6 | 6 | 1 | 0 | 0 | 121 | 0 | 7 | 111 | 20243 | 98 | 9.4736 | 5 |
| 25-18.6 | 131 448 1324 | 6 | 9 | 26 | 35 | 12 | 10 | 6 | 0 | 0 | 0 | 123 | 9 | 6 | 47 | 18698 | 4 | 9.4747 | 6 |
| 25-18.7 | 132 449 1325 | 7 | 0 | 38 | 30 | 14 | 10 | 0 | 4 | 0 | 0 | 121 | 0 | 7 | 112 | 20244 | 99 | 9.4761 | 7 |
| 25-18.8 | 133 440 1350 | 8 | 15 | 24 | 29 | 17 | 9 | 5 | 1 | 0 | 0 | 125 | 15 | 7 | 19 | 16697 | 100 | 9.4765 | 8 |
| 25-18.9 | 133 442 1326 | 9 | 0 | 43 | 20 | 20 | 5 | 7 | 1 | 0 | 0 | 121 | 0 | 7 | 113 | 20245 | 101 | 9.4765 | 10 |
| 25-18.10 | 133 442 1326 | 10 | 3 | 34 | 29 | 17 | 5 | 7 | 1 | 0 | 0 | 121 | 3 | 7 | 115 | 19942 | 103 | 9.4765 | 9 |
| 25-18.11 | 133 442 1326 | 10 | 0 | 39 | 31 | 10 | 9 | 5 | 2 | 0 | 0 | 121 | 0 | 7 | 114 | 20246 | 102 | 9.4765 | 10 |
| 25-18.12 | 134 444 1280 | 12 | 0 | 54 | 16 | 0 | 24 | 4 | 0 | 0 | 0 | 123 | 0 | 6 | 48 | 20247 | 5 | 9.4777 | 12 |
| 25-18.13 | 135 432 1348 | 13 | 12 | 18 | 43 | 3 | 15 | 6 | 0 | 0 | 0 | 122 | 12 | 6 | 95 | 17805 | 6 | 9.4781 | 13 |
| 25-18.14 | 135 435 1320 | 14 | 3 | 36 | 29 | 12 | 6 | 10 | 0 | 0 | 0 | 121 | 3 | 6 | 117 | 19943 | 8 | 9.4782 | 14 |
| 25-18.15a | 135 435 1320 | 14 | 0 | 30 | 35 | 15 | 3 | 10 | 0 | 0 | 0 | 118 | 0 | 6 | 706 | 20248 | 9 | 9.4782 | 14 |
| 25-18.15b | 135 435 1320 | 14 | 0 | 45 | 20 | 15 | 6 | 10 | 0 | 0 | 0 | 121 | 0 | 6 | 116 | 20248 | 7 | 9.4782 | 14 |
| 25-18.17 | 135 442 1310 | 17 | 0 | 44 | 18 | 21 | 9 | 0 | 3 | 1 | 0 | 121 | 0 | 8 | 118 | 20250 | 3425 | 9.4791 | 17 |
| 25-18.18 | 135 442 1310 | 18 | 0 | 38 | 36 | 3 | 15 | 0 | 3 | 1 | 0 | 121 | 0 | 8 | 119 | 20251 | 3426 | 9.4791 | 18 |
| 25-18.19 | 136 432 1338 | 19 | 15 | 24 | 37 | 3 | 12 | 9 | 0 | 0 | 0 | 125 | 15 | 6 | 20 | 16698 | 10 | 9.4794 | 20 |
| 25-18.20 | 136 435 1317 | 20 | 3 | 39 | 20 | 21 | 6 | 4 | 3 | 0 | 0 | 121 | 3 | 7 | 120 | 19944 | 104 | 9.4796 | 21 |

k = 25, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25-18.1 | 124 | 482 | 1312 | 1 | 0 | 64 | 0 | 18 | 20 | 0 | 0 | 0 | 0 | 0 | | 127 | 0 | 5 | 1 | 20240 | 1 | 9.4697 | 1 |
| 25-18.2 | 125 | 504 | 1222 | 2 | 0 | 41 | 48 | 6 | 0 | 0 | 6 | 1 | 0 | 0 | | 127 | 0 | 8 | 2 | 20241 | 3424 | 9.4730 | 3 |
| 25-18.27 | 138 | 448 | 1296 | 27 | 12 | 48 | 0 | 27 | 12 | 0 | 0 | 3 | 0 | 0 | | 127 | 12 | 8 | 3 | 17806 | 3427 | 9.4839 | 44 |
| 25-18.51 | 142 | 416 | 1344 | 51 | 20 | 30 | 20 | 10 | 16 | 4 | 0 | 2 | 0 | 0 | | 127 | 20 | 8 | 4 | 14176 | 3437 | 9.4854 | 66 |
| 25-18.63 | 143 | 419 | 1312 | 63 | 25 | 16 | 36 | 0 | 20 | 0 | 5 | 0 | 0 | 0 | | 127 | 25 | 7 | 5 | 4870 | 130 | 9.4868 | 104 |
| 25-18.134 | 146 | 408 | 1336 | 134 | 25 | 22 | 22 | 14 | 9 | 8 | 0 | 2 | 0 | 0 | | 127 | 25 | 8 | 6 | 4871 | 3481 | 9.4896 | 239 |
| 25-18.136 | 146 | 440 | 1232 | 136 | 12 | 53 | 0 | 17 | 12 | 6 | 0 | 1 | 0 | 1 | | 127 | 12 | 10 | 7 | 17814 | 17107 | 9.4929 | 570 |
| 25-18.193 | 147 | 423 | 1280 | 193 | 20 | 32 | 22 | 0 | 25 | 0 | 1 | 0 | 2 | 0 | | 127 | 20 | 9 | 8 | 14184 | 11141 | 9.4925 | 521 |
| 25-18.874 | 154 | 400 | 1296 | 874 | 28 | 22 | 16 | 16 | 12 | 5 | 0 | 2 | 0 | 1 | | 127 | 28 | 10 | 9 | 988 | 17188 | 9.4990 | 1767 |
| 25-18.988 | 155 | 367 | 1440 | 988 | 36 | 0 | 42 | 0 | 15 | 0 | 9 | 0 | 0 | 0 | | 127 | 36 | 7 | 10 | 44 | 176 | 9.4973 | 1366 |
| 25-18.1021 | 155 | 399 | 1280 | 1021 | 36 | 0 | 39 | 0 | 24 | 0 | 0 | 0 | 3 | 0 | | 127 | 36 | 9 | 11 | 45 | 11472 | 9.5000 | 2053 |
| 25-18.1022 | 155 | 415 | 1232 | 1022 | 23 | 32 | 18 | 0 | 24 | 0 | 4 | 0 | 0 | 0 | 1 | 127 | 23 | 11 | 12 | 13544 | 19796 | 9.5017 | 2559 |
| 25-18.2757 | 163 | 359 | 1392 | 2757 | 39 | 0 | 36 | 0 | 21 | 0 | 3 | 0 | 3 | 0 | 0 | 127 | 39 | 9 | 13 | 43 | 12242 | 9.5066 | 4973 |
| 25-18.59 | 143 | 404 | 1386 | 59 | 20 | 31 | 10 | 25 | 4 | 10 | 0 | 1 | 0 | 0 | 0 | 126 | 20 | 8 | 14 | 14178 | 3440 | 9.4855 | 71 |
| 25-18.137 | 146 | 456 | 1184 | 137 | 0 | 72 | 0 | 0 | 24 | 4 | 0 | 0 | 0 | 0 | 0 1 | 126 | 0 | 12 | 15 | 20267 | 20477 | 9.4946 | 796 |

k = 25, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25-18.20549a | 304 | 61 | 3105 | 20549 | 47 | 0 | 0 | 0 | 0 | 0 | 3 | 21 | 6 | 1 | 103 | 47 | 10 | 20527 | 1 | 19773 | 9.6836 | 20549 |
| 25-18.20549b | 304 | 61 | 3105 | 20549 | 47 | 0 | 0 | 0 | 0 | 0 | 4 | 18 | 9 | 0 | 103 | 47 | 9 | 20527 | 1 | 17104 | 9.6836 | 20549 |
| 25-18.20551 | 304 | 62 | 3105 | 20551 | 47 | 0 | 0 | 0 | 0 | 0 | 4 | 18 | 9 | 0 | 103 | 47 | 9 | 20529 | 3 | 17105 | 9.6837 | 20551 |
| 25-18.20552 | 304 | 63 | 3105 | 20552 | 47 | 0 | 0 | 0 | 0 | 0 | 3 | 21 | 6 | 1 | 103 | 47 | 10 | 20530 | 4 | 19774 | 9.6839 | 20552 |
| 25-18.20553 | 305 | 60 | 3096 | 20553 | 47 | 0 | 0 | 0 | 0 | 0 | 6 | 15 | 9 | 1 | 103 | 47 | 10 | 20531 | 5 | 19775 | 9.6847 | 20553 |
| 25-18.20554 | 305 | 61 | 3096 | 20554 | 47 | 0 | 0 | 0 | 0 | 0 | 6 | 15 | 9 | 1 | 103 | 47 | 10 | 20532 | 6 | 19776 | 9.6848 | 20554 |
| 25-18.20555 | 305 | 61 | 3096 | 20555 | 47 | 0 | 0 | 0 | 0 | 0 | 6 | 15 | 9 | 1 | 103 | 47 | 10 | 20533 | 7 | 19777 | 9.6848 | 20555 |
| 25-18.20556 | 305 | 62 | 3096 | 20556 | 47 | 0 | 0 | 0 | 0 | 0 | 6 | 15 | 9 | 1 | 103 | 47 | 10 | 20534 | 8 | 19778 | 9.6850 | 20556 |
| 25-18.20557 | 306 | 60 | 3089 | 20557 | 47 | 0 | 0 | 0 | 0 | 0 | 8 | 12 | 9 | 2 | 103 | 47 | 10 | 20535 | 9 | 19779 | 9.6860 | 20557 |

k = 25, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25-18.1 | 124 | 482 | 1312 | 1 | 0 | 64 | 0 | 18 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 0 | 5 | 1 | 20240 | 1 | 9.4697 | 1 |
| 25-18.3 | 126 | 468 | 1304 | 3 | 0 | 42 | 28 | 12 | 12 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 0 | 6 | 45 | 20242 | 2 | 9.4704 | 2 |
| 25-18.4 | 129 | 458 | 1310 | 4 | 5 | 33 | 34 | 7 | 15 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 5 | 6 | 46 | 19619 | 3 | 9.4732 | 4 |
| 25-18.6 | 131 | 448 | 1324 | 6 | 9 | 26 | 35 | 12 | 10 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 9 | 6 | 47 | 18698 | 4 | 9.4747 | 6 |
| 25-18.12 | 134 | 444 | 1280 | 12 | 0 | 54 | 16 | 0 | 24 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 0 | 6 | 48 | 20247 | 5 | 9.4777 | 12 |
| 25-18.13 | 135 | 432 | 1348 | 13 | 12 | 18 | 43 | 3 | 15 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 12 | 6 | 95 | 17805 | 6 | 9.4781 | 13 |
| 25-18.15b | 135 | 435 | 1320 | 14 | 0 | 45 | 20 | 15 | 6 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 0 | 6 | 116 | 20248 | 7 | 9.4782 | 14 |
| 25-18.14 | 135 | 435 | 1320 | 14 | 3 | 36 | 29 | 12 | 6 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 3 | 6 | 117 | 19943 | 7 | 9.4782 | 14 |
| 25-18.15a | 135 | 435 | 1320 | 14 | 0 | 30 | 35 | 15 | 3 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | 0 | 6 | 706 | 20248 | 7 | 9.4782 | 14 |
| 25-18.19 | 136 | 432 | 1338 | 19 | 15 | 24 | 37 | 3 | 12 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 15 | 6 | 20 | 16698 | 10 | 9.4794 | 20 |

k = 25, Design generators

| Design | Design Generators |
|---|---|
| 25-18.1 | 7 11 19 29 37 41 47 49 55 59 62 77 78 82 84 91 102 120 |
| 25-18.2 | 7 11 19 25 26 35 45 53 63 67 78 86 92 100 103 106 114 120 |
| 25-18.3 | 7 11 19 29 35 46 53 57 60 73 76 82 87 100 109 118 120 123 |
| 25-18.4 | 7 11 19 30 38 47 57 69 73 79 82 84 93 97 98 108 119 120 |
| 25-18.5 | 7 11 13 19 21 38 41 55 59 70 73 87 91 99 101 106 116 120 |
| 25-18.6 | 7 11 19 29 37 41 49 55 59 77 78 91 97 98 111 116 120 125 |
| 25-18.7 | 7 11 19 29 37 41 55 59 77 78 82 87 91 99 102 106 116 120 |
| 25-18.8 | 7 11 19 29 37 44 50 52 59 62 73 82 87 106 111 117 118 120 |
| 25-18.9 | 7 11 19 29 37 41 59 73 76 82 87 94 99 106 111 117 118 120 |
| 25-18.10 | 7 11 19 29 37 44 50 59 62 73 82 87 99 106 111 117 118 120 |
| 25-18.11 | 7 11 13 19 31 38 41 55 59 70 73 87 91 99 101 106 116 120 |
| 25-18.12 | 7 11 19 29 35 46 53 57 69 73 76 82 87 100 109 118 120 123 |
| 25-18.13 | 7 11 19 30 38 47 52 57 69 73 79 82 84 93 97 98 119 120 |
| 25-18.14 | 7 11 19 29 35 53 57 69 73 76 82 94 98 100 109 118 120 123 |
| 25-18.15a | 7 11 19 29 35 53 57 70 73 76 82 94 97 100 109 118 120 123 |
| 25-18.15b | 7 11 13 19 21 38 41 52 62 69 79 87 89 100 106 114 120 125 |
| 25-18.17 | 7 11 19 29 37 50 59 62 73 76 82 87 99 106 111 117 118 120 |
| 25-18.18 | 7 11 19 29 37 59 62 73 76 82 87 91 99 106 111 117 118 120 |
| 25-18.19 | 7 11 19 29 30 38 41 50 60 78 82 87 91 100 106 117 118 120 |
| 25-18.20 | 7 11 19 29 35 38 41 44 50 55 69 73 82 92 95 100 120 125 |
| 25-18.27 | 7 11 19 29 30 38 57 60 70 89 92 99 109 110 117 118 120 123 |
| 25-18.51 | 7 11 13 14 19 22 26 41 53 60 73 74 76 85 97 103 120 126 |
| 25-18.59 | 7 11 21 26 28 42 44 51 77 78 95 104 107 112 118 121 122 124 |
| 25-18.63 | 7 11 19 29 35 46 53 69 70 73 79 81 87 94 109 118 120 123 |
| 25-18.134 | 7 11 13 14 19 35 38 44 57 58 69 81 82 87 93 106 111 120 |
| 25-18.136 | 7 11 13 30 35 53 54 67 85 86 102 104 112 115 121 122 124 127 |
| 25-18.137 | 7 11 19 22 25 26 28 31 35 45 46 67 77 78 117 118 120 123 |
| 25-18.193 | 7 11 13 30 35 53 54 78 85 86 102 104 112 115 121 122 124 127 |
| 25-18.874 | 7 11 19 29 35 45 52 58 67 69 70 73 74 79 81 97 118 120 |
| 25-18.988 | 7 27 30 35 41 42 44 67 74 82 87 101 104 112 121 122 124 127 |
| 25-18.1021 | 7 11 19 29 35 45 58 67 69 70 73 74 79 81 97 118 120 123 |
| 25-18.1022 | 7 11 13 14 19 22 26 31 41 53 60 73 85 92 97 100 109 120 |
| 25-18.2757 | 7 11 13 14 19 22 25 26 35 41 60 85 92 95 103 114 120 123 |
| 25-18.20549a | 7 19 21 22 35 37 38 49 55 67 69 81 84 95 100 103 112 117 |
| 25-18.20549b | 7 19 21 22 35 37 38 49 52 67 69 70 81 87 97 111 112 115 |
| 25-18.20551 | 7 19 21 22 35 37 38 49 67 69 70 81 87 97 100 111 112 115 |
| 25-18.20552 | 7 19 21 22 35 37 38 49 52 67 81 82 87 92 100 103 112 115 |
| 25-18.20553 | 7 19 21 22 35 37 38 49 67 69 81 82 87 97 111 112 115 118 |
| 25-18.20554 | 7 19 21 22 35 37 38 49 50 67 69 70 81 87 97 111 112 115 |
| 25-18.20555 | 7 19 21 22 35 37 38 49 67 69 70 81 87 97 98 111 112 115 |
| 25-18.20556 | 7 19 21 22 35 37 38 67 69 81 82 87 92 100 103 112 117 118 |
| 25-18.20557 | 7 19 21 22 35 37 38 49 67 69 70 81 82 87 97 111 112 115 |

k = 26, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26-19.1 | 152 568 1704 | 1 | 0 | 29 | 41 | 4 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 6 | 13 | 13068 | 1 | 8.5797 | 1 |
| 26-19.2 | 155 555 1720 | 2 | 5 | 20 | 45 | 5 | 13 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 5 | 6 | 14 | 12525 | 2 | 8.5819 | 2 |
| 26-19.3 | 160 530 1767 | 3 | 0 | 30 | 30 | 20 | 6 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 7 | 43 | 13069 | 8 | 8.5854 | 3 |
| 26-19.4 | 161 530 1758 | 4 | 0 | 33 | 23 | 25 | 5 | 6 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 8 | 44 | 13070 | 708 | 8.5865 | 4 |
| 26-19.5 | 163 520 1783 | 5 | 15 | 18 | 27 | 19 | 15 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 15 | 7 | 3 | 10630 | 9 | 8.5879 | 5 |
| 26-19.6 | 163 523 1752 | 6 | 0 | 36 | 19 | 25 | 6 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 7 | 45 | 13071 | 10 | 8.5880 | 6 |
| 26-19.7 | 163 523 1752 | 7 | 3 | 30 | 19 | 31 | 3 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 3 | 7 | 46 | 12806 | 11 | 8.5880 | 6 |
| 26-19.8 | 164 523 1743 | 8 | 0 | 33 | 29 | 14 | 10 | 6 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 8 | 47 | 13072 | 709 | 8.5892 | 8 |
| 26-19.9 | 164 536 1664 | 9 | 0 | 42 | 28 | 0 | 12 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 7 | 15 | 13073 | 12 | 8.5900 | 9 |
| 26-19.10 | 166 516 1737 | 10 | 0 | 39 | 17 | 21 | 9 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 7 | 48 | 13074 | 13 | 8.5907 | 10 |
| 26-19.11 | 167 516 1728 | 11 | 0 | 42 | 8 | 30 | 6 | 6 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 8 | 49 | 13075 | 710 | 8.5918 | 12 |
| 26-19.12 | 168 492 1912 | 12 | 24 | 3 | 27 | 31 | 6 | 6 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 24 | 8 | 4 | 8959 | 711 | 8.5918 | 11 |
| 26-19.13 | 168 524 1672 | 13 | 5 | 33 | 32 | 2 | 9 | 14 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 5 | 7 | 16 | 12526 | 14 | 8.5935 | 15 |
| 26-19.14 | 169 490 1830 | 14 | 8 | 22 | 24 | 29 | 1 | 5 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 122 | 8 | 8 | 50 | 11866 | 712 | 8.5920 | 13 |
| 26-19.15 | 169 509 1722 | 15 | 3 | 33 | 24 | 14 | 12 | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 3 | 7 | 51 | 12807 | 15 | 8.5933 | 14 |
| 26-19.16 | 170 506 1746 | 16 | 15 | 21 | 30 | 13 | 6 | 9 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 15 | 7 | 5 | 10631 | 16 | 8.5944 | 19 |
| 26-19.17 | 170 509 1725 | 17 | 0 | 42 | 16 | 15 | 13 | 4 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 8 | 52 | 13076 | 713 | 8.5946 | 21 |

k = 26, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26-19.224 | 181 468 1808 | 224 | 20 | 31 | 0 | 31 | 8 | 0 | 10 | 0 | 1 | 0 | 0 | 0 | 0 | 127 | 20 | 9 | 1 | 9213 | 4570 | 8.6037 | 370 |
| 26-19.997 | 190 528 1520 | 997 | 0 | 72 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 127 | 0 | 13 | 2 | 13371 | 13476 | 8.6194 | 4435 |
| 26-19.5 | 163 520 1783 | 5 | 15 | 18 | 27 | 19 | 15 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 15 | 7 | 3 | 10630 | 9 | 8.5879 | 5 |
| 26-19.12 | 168 492 1912 | 12 | 24 | 3 | 27 | 31 | 6 | 6 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 24 | 8 | 4 | 8959 | 711 | 8.5918 | 11 |
| 26-19.16 | 170 506 1746 | 16 | 15 | 21 | 30 | 13 | 6 | 9 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 15 | 7 | 5 | 10631 | 16 | 8.5944 | 19 |
| 26-19.48 | 176 484 1848 | 48 | 24 | 3 | 30 | 34 | 0 | 0 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 126 | 24 | 8 | 6 | 8960 | 732 | 8.5999 | 113 |
| 26-19.49 | 176 486 1758 | 49 | 18 | 22 | 20 | 19 | 8 | 7 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 18 | 8 | 7 | 9448 | 733 | 8.5994 | 87 |
| 26-19.935 | 190 418 1978 | 935 | 24 | 21 | 18 | 10 | 9 | 9 | 6 | 3 | 0 | 0 | 0 | 0 | 0 | 126 | 24 | 8 | 8 | 8961 | 786 | 8.6102 | 1197 |
| 26-19.1462 | 194 414 1950 | 1462 | 27 | 18 | 15 | 13 | 12 | 6 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 126 | 27 | 8 | 9 | 1151 | 791 | 8.6143 | 2180 |
| 26-19.1063 | 191 416 1939 | 1063 | 24 | 12 | 24 | 24 | 0 | 0 | 13 | 0 | 2 | 0 | 0 | 0 | 0 | 125 | 24 | 9 | 10 | 8962 | 4949 | 8.6109 | 1312 |
| 26-19.1187 | 192 412 1932 | 1187 | 24 | 14 | 20 | 26 | 0 | 1 | 11 | 1 | 2 | 0 | 0 | 0 | 0 | 125 | 24 | 9 | 11 | 8963 | 5004 | 8.6115 | 1449 |
| 26-19.1460 | 194 412 1912 | 1460 | 24 | 18 | 12 | 30 | 0 | 1 | 12 | 0 | 1 | 1 | 0 | 0 | 0 | 125 | 24 | 10 | 12 | 8964 | 9542 | 8.6137 | 2037 |
| 26-19.1 | 152 568 1704 | 1 | 0 | 29 | 41 | 4 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 6 | 13 | 13068 | 1 | 8.5797 | 1 |
| 26-19.2 | 155 555 1720 | 2 | 5 | 20 | 45 | 5 | 13 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 5 | 6 | 14 | 12525 | 2 | 8.5819 | 2 |
| 26-19.9 | 164 536 1664 | 9 | 0 | 42 | 28 | 0 | 12 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 7 | 15 | 13073 | 12 | 8.5900 | 9 |

k = 26, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26-19.13485 | 365 70 4138 | 13485 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 22 | 3 | 0 | 0 | 0 | 106 | 49 | 10 | 13472 | 1 | 12014 | 8.8115 | 13485 |
| 26-19.13486 | 365 71 4138 | 13486 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 22 | 3 | 0 | 0 | 0 | 106 | 49 | 10 | 13473 | 2 | 12015 | 8.8117 | 13486 |
| 26-19.13487 | 366 69 4129 | 13487 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 16 | 6 | 0 | 0 | 0 | 106 | 49 | 10 | 13474 | 3 | 12016 | 8.8125 | 13487 |
| 26-19.13488 | 366 70 4128 | 13488 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 16 | 6 | 0 | 0 | 0 | 106 | 49 | 10 | 13475 | 4 | 12017 | 8.8127 | 13488 |
| 26-19.13489 | 366 70 4129 | 13489 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 16 | 6 | 0 | 0 | 0 | 106 | 49 | 10 | 13476 | 5 | 12018 | 8.8127 | 13489 |
| 26-19.13490 | 366 71 4129 | 13490 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 16 | 6 | 0 | 0 | 0 | 106 | 49 | 10 | 13477 | 6 | 12019 | 8.8128 | 13490 |
| 26-19.13491 | 367 69 4120 | 13491 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 13 | 6 | 1 | 0 | 0 | 106 | 49 | 11 | 13478 | 7 | 13214 | 8.8137 | 13491 |
| 26-19.13492 | 367 71 4120 | 13492 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 13 | 6 | 1 | 0 | 0 | 106 | 49 | 11 | 13479 | 8 | 13215 | 8.8139 | 13492 |
| 26-19.13493 | 369 68 4106 | 13493 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 4 | 9 | 2 | 0 | 0 | 106 | 49 | 11 | 13480 | 9 | 13216 | 8.8158 | 13493 |
| 26-19.13494 | 369 69 4106 | 13494 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 4 | 9 | 2 | 0 | 0 | 106 | 49 | 11 | 13481 | 10 | 13217 | 8.8160 | 13494 |

k = 26, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26-19.1 | 152 568 1704 | 1 | 0 | 29 | 41 | 4 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 6 | 13 | 13068 | 1 | 8.5797 | 1 |
| 26-19.2 | 155 555 1720 | 2 | 5 | 20 | 45 | 5 | 13 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 124 | 5 | 6 | 14 | 12525 | 2 | 8.5819 | 2 |
| 26-19.1862 | 198 237 2813 | 1862 | 25 | 0 | 2 | 18 | 30 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 113 | 25 | 6 | 3692 | 4678 | 3 | 8.6050 | 503 |
| 26-19.2093 | 200 235 2795 | 2093 | 25 | 0 | 10 | 0 | 42 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 113 | 25 | 6 | 3733 | 4680 | 4 | 8.6070 | 742 |
| 26-19.2095a | 200 236 2795 | 2095 | 25 | 0 | 1 | 27 | 15 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 113 | 25 | 6 | 3736 | 4682 | 5 | 8.6071 | 765 |
| 26-19.2098 | 200 237 2795 | 2098 | 25 | 0 | 4 | 18 | 24 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 113 | 25 | 6 | 3738 | 4685 | 6 | 8.6073 | 784 |
| 26-19.2612b | 204 231 2779 | 2612 | 25 | 0 | 10 | 12 | 18 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 113 | 25 | 6 | 3883 | 4751 | 7 | 8.6113 | 1387 |
| 26-19.3 | 160 530 1767 | 3 | 0 | 30 | 30 | 20 | 6 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 7 | 43 | 13069 | 8 | 8.5854 | 3 |
| 26-19.5 | 163 520 1783 | 5 | 15 | 18 | 27 | 19 | 15 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 15 | 7 | 3 | 10630 | 9 | 8.5879 | 5 |
| 26-19.6 | 163 523 1752 | 6 | 0 | 36 | 19 | 25 | 6 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 122 | 0 | 7 | 45 | 13071 | 10 | 8.5880 | 6 |

k = 26, Design generators

| Design | Design Generators | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26-19.1 | 7 | 11 | 19 | 29 | 37 | 41 | 49 | 55 | 59 | 77 | 78 | 87 | 91 | 97 | 98 | 111 | 116 | 120 | 125 | |
| 26-19.2 | 7 | 11 | 19 | 30 | 38 | 47 | 52 | 57 | 58 | 69 | 73 | 79 | 82 | 84 | 93 | 97 | 98 | 119 | 120 | |
| 26-19.3 | 7 | 11 | 13 | 19 | 21 | 31 | 38 | 41 | 55 | 59 | 70 | 73 | 87 | 91 | 99 | 101 | 106 | 116 | 120 | |
| 26-19.4 | 7 | 11 | 19 | 29 | 37 | 41 | 50 | 55 | 59 | 77 | 78 | 82 | 87 | 91 | 99 | 102 | 106 | 116 | 120 | |
| 26-19.5 | 7 | 11 | 19 | 29 | 35 | 38 | 41 | 44 | 50 | 55 | 69 | 73 | 92 | 95 | 100 | 103 | 113 | 120 | 125 | |
| 26-19.6 | 7 | 11 | 19 | 29 | 37 | 41 | 44 | 59 | 73 | 76 | 82 | 87 | 94 | 99 | 106 | 111 | 117 | 118 | 120 | |
| 26-19.7 | 7 | 11 | 19 | 29 | 35 | 38 | 41 | 44 | 50 | 55 | 69 | 73 | 82 | 92 | 95 | 100 | 103 | 120 | 125 | |
| 26-19.8 | 7 | 11 | 19 | 29 | 37 | 41 | 44 | 55 | 59 | 77 | 78 | 82 | 87 | 91 | 99 | 102 | 106 | 116 | 120 | |
| 26-19.9 | 7 | 11 | 19 | 29 | 35 | 46 | 53 | 57 | 60 | 69 | 73 | 76 | 82 | 87 | 100 | 109 | 118 | 120 | 123 | |
| 26-19.10 | 7 | 11 | 19 | 29 | 37 | 41 | 44 | 55 | 59 | 73 | 76 | 82 | 87 | 100 | 103 | 106 | 113 | 120 | 125 | |
| 26-19.11 | 7 | 11 | 19 | 29 | 35 | 38 | 41 | 44 | 50 | 55 | 69 | 73 | 82 | 92 | 95 | 97 | 100 | 120 | 125 | |
| 26-19.12 | 7 | 27 | 29 | 30 | 35 | 37 | 38 | 41 | 49 | 67 | 69 | 76 | 84 | 104 | 112 | 121 | 122 | 124 | 127 | |
| 26-19.13 | 7 | 11 | 19 | 30 | 38 | 41 | 49 | 50 | 52 | 77 | 78 | 82 | 84 | 91 | 97 | 108 | 119 | 120 | 126 | |
| 26-19.14 | 7 | 11 | 19 | 29 | 30 | 38 | 41 | 49 | 60 | 78 | 82 | 87 | 91 | 97 | 98 | 100 | 117 | 118 | 120 | |
| 26-19.15 | 7 | 11 | 19 | 29 | 37 | 41 | 44 | 50 | 55 | 59 | 73 | 76 | 87 | 100 | 103 | 106 | 113 | 120 | 125 | |
| 26-19.16 | 7 | 11 | 19 | 29 | 38 | 41 | 47 | 49 | 70 | 79 | 89 | 90 | 99 | 106 | 108 | 114 | 116 | 120 | 123 | |
| 26-19.17 | 7 | 11 | 14 | 19 | 35 | 37 | 38 | 41 | 52 | 59 | 69 | 70 | 89 | 90 | 95 | 103 | 106 | 117 | 120 | |
| 26-19.48 | 7 | 11 | 19 | 29 | 30 | 35 | 37 | 38 | 41 | 42 | 50 | 60 | 69 | 73 | 76 | 113 | 116 | 120 | 125 | |
| 26-19.49 | 7 | 11 | 19 | 29 | 35 | 37 | 38 | 41 | 44 | 50 | 55 | 69 | 73 | 92 | 95 | 100 | 113 | 120 | 125 | |
| 26-19.224 | 7 | 11 | 19 | 22 | 28 | 38 | 52 | 57 | 69 | 70 | 73 | 79 | 82 | 84 | 93 | 98 | 108 | 119 | 120 | |
| 26-19.935 | 7 | 11 | 13 | 21 | 26 | 47 | 51 | 54 | 78 | 81 | 100 | 104 | 107 | 109 | 112 | 121 | 122 | 124 | 127 | |
| 26-19.997 | 7 | 11 | 19 | 21 | 22 | 25 | 26 | 28 | 31 | 35 | 45 | 46 | 67 | 77 | 78 | 117 | 118 | 120 | 123 | |
| 26-19.1063 | 7 | 11 | 13 | 14 | 19 | 38 | 57 | 60 | 73 | 85 | 95 | 101 | 106 | 113 | 114 | 116 | 120 | 125 | 126 | |
| 26-19.1187 | 7 | 11 | 13 | 19 | 25 | 26 | 41 | 53 | 59 | 78 | 86 | 95 | 97 | 98 | 104 | 112 | 121 | 122 | 124 | |
| 26-19.1460 | 7 | 11 | 19 | 29 | 30 | 38 | 41 | 47 | 70 | 81 | 82 | 84 | 87 | 99 | 101 | 121 | 122 | 124 | 127 | |
| 26-19.1462 | 7 | 11 | 19 | 29 | 37 | 38 | 41 | 42 | 44 | 50 | 62 | 77 | 78 | 85 | 89 | 99 | 111 | 118 | 120 | |
| 26-19.1862 | 7 | 11 | 21 | 26 | 35 | 37 | 41 | 52 | 59 | 74 | 79 | 86 | 100 | 103 | 104 | 112 | 121 | 122 | 124 | |
| 26-19.2093 | 7 | 11 | 21 | 26 | 35 | 37 | 41 | 52 | 59 | 61 | 74 | 79 | 86 | 100 | 104 | 112 | 121 | 122 | 124 | |
| 26-19.2095a | 7 | 11 | 21 | 26 | 35 | 37 | 41 | 52 | 56 | 74 | 79 | 86 | 100 | 103 | 104 | 112 | 121 | 122 | 124 | |
| 26-19.2098 | 7 | 11 | 21 | 26 | 35 | 37 | 41 | 52 | 59 | 61 | 79 | 86 | 100 | 103 | 104 | 112 | 121 | 122 | 124 | |
| 26-19.2612b | 7 | 11 | 22 | 25 | 31 | 35 | 46 | 50 | 52 | 69 | 93 | 98 | 103 | 104 | 109 | 112 | 121 | 122 | 124 | |
| 26-19.13485 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 52 | 67 | 69 | 70 | 81 | 87 | 97 | 98 | 111 | 112 | 115 | |
| 26-19.13486 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 50 | 67 | 69 | 70 | 81 | 87 | 97 | 100 | 111 | 112 | 115 | |
| 26-19.13487 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 52 | 67 | 69 | 70 | 81 | 82 | 87 | 97 | 111 | 112 | 115 | |
| 26-19.13488 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 67 | 69 | 81 | 82 | 87 | 92 | 98 | 100 | 103 | 112 | 117 | 118 | |
| 26-19.13489 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 50 | 52 | 67 | 69 | 70 | 81 | 87 | 97 | 111 | 112 | 115 | |
| 26-19.13490 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 50 | 67 | 69 | 70 | 81 | 84 | 98 | 112 | 117 | 118 | 123 | |
| 26-19.13491 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 50 | 67 | 69 | 70 | 81 | 82 | 87 | 97 | 111 | 112 | 115 | |
| 26-19.13492 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 50 | 52 | 67 | 81 | 82 | 87 | 92 | 100 | 103 | 112 | 115 | |
| 26-19.13493 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 50 | 67 | 69 | 70 | 81 | 82 | 84 | 87 | 97 | 111 | 112 | |
| 26-19.13494 | 7 | 19 | 21 | 22 | 35 | 37 | 38 | 49 | 67 | 69 | 70 | 81 | 82 | 84 | 87 | 97 | 111 | 112 | 118 | |

k = 27, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27-20.1 | 180 690 2200 | 1 | 0 | 15 | 55 | 0 | 12 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 0 | 6 | 6 | 7696 | 1 | 7.7798 | 1 |
| 27-20.2 | 195 624 2304 | 2 | 0 | 30 | 12 | 39 | 3 | 2 | 9 | 0 | 1 | 0 | 0 | 0 | 0 | 123 | 0 | 9 | 19 | 7697 | 1326 | 7.7898 | 2 |
| 27-20.3 | 196 646 2152 | 3 | 0 | 29 | 41 | 0 | 4 | 18 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 0 | 7 | 7 | 7698 | 3 | 7.7920 | 5 |
| 27-20.4a | 197 617 2296 | 4 | 0 | 33 | 9 | 35 | 9 | 0 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 123 | 0 | 8 | 20 | 7699 | 71 | 7.7912 | 3 |
| 27-20.4b | 197 617 2296 | 4 | 0 | 30 | 18 | 26 | 12 | 0 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 123 | 0 | 8 | 20 | 7699 | 71 | 7.7912 | 3 |
| 27-20.6 | 200 610 2278 | 6 | 0 | 33 | 15 | 24 | 14 | 0 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 123 | 0 | 8 | 22 | 7701 | 73 | 7.7935 | 6 |
| 27-20.7 | 200 630 2172 | 7 | 5 | 20 | 45 | 0 | 7 | 11 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 5 | 7 | 8 | 7316 | 4 | 7.7948 | 8 |
| 27-20.8 | 201 610 2274 | 8 | 0 | 30 | 24 | 16 | 15 | 1 | 8 | 0 | 2 | 0 | 0 | 0 | 0 | 123 | 0 | 9 | 23 | 7702 | 1327 | 7.7946 | 7 |
| 27-20.9 | 202 588 2488 | 9 | 24 | 0 | 16 | 45 | 0 | 12 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 127 | 24 | 9 | 1 | 5505 | 1328 | 7.7950 | 9 |
| 27-20.10 | 203 603 2266 | 10 | 0 | 36 | 12 | 22 | 16 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 123 | 0 | 8 | 24 | 7703 | 74 | 7.7959 | 10 |
| 27-20.11 | 206 596 2248 | 11 | 3 | 30 | 18 | 17 | 18 | 0 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 123 | 3 | 8 | 25 | 7499 | 75 | 7.7983 | 13 |
| 27-20.12 | 207 592 2279 | 12 | 15 | 18 | 22 | 24 | 0 | 15 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 127 | 15 | 8 | 2 | 5934 | 76 | 7.7992 | 17 |
| 27-20.13 | 207 596 2244 | 13 | 0 | 42 | 0 | 29 | 15 | 0 | 7 | 0 | 3 | 0 | 0 | 0 | 0 | 123 | 0 | 9 | 26 | 7704 | 1329 | 7.7993 | 20 |
| 27-20.14 | 208 566 2488 | 14 | 20 | 2 | 33 | 6 | 28 | 6 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 125 | 20 | 10 | 9 | 5541 | 3728 | 7.7992 | 16 |
| 27-20.15 | 209 565 2384 | 15 | 8 | 22 | 16 | 28 | 10 | 2 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 123 | 8 | 8 | 27 | 6937 | 77 | 7.7993 | 18 |
| 27-20.16 | 210 546 2512 | 16 | 18 | 9 | 28 | 9 | 18 | 13 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 125 | 18 | 9 | 10 | 5651 | 1330 | 7.7993 | 19 |
| 27-20.17 | 210 548 2472 | 17 | 8 | 6 | 48 | 1 | 18 | 6 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 121 | 8 | 9 | 83 | 6938 | 1331 | 7.7994 | 21 |
| 27-20.18a | 210 562 2314 | 18 | 0 | 3 | 29 | 42 | 6 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 114 | 0 | 9 | 6488 | 7705 | 1332 | 7.7995 | 24 |
| 27-20.18b | 210 562 2314 | 18 | 0 | 3 | 27 | 48 | 0 | 2 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 114 | 0 | 9 | 6488 | 7705 | 1332 | 7.7995 | 24 |
| 27-20.20 | 210 563 2314 | 20 | 0 | 3 | 29 | 42 | 6 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 114 | 0 | 9 | 6490 | 7707 | 1334 | 7.7997 | 27 |

k = 27, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27-20.9 | 202 588 2488 | 9 | 24 | 0 | 16 | 45 | 0 | 12 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 127 | 24 | 9 | 1 | 5505 | 1328 | 7.7950 | 9 |
| 27-20.12 | 207 592 2279 | 12 | 15 | 18 | 22 | 24 | 0 | 15 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 127 | 15 | 8 | 2 | 5934 | 76 | 7.7992 | 17 |
| 27-20.23 | 210 580 2416 | 23 | 24 | 0 | 16 | 51 | 0 | 0 | 0 | 6 | 3 | 0 | 0 | 0 | 0 | 127 | 24 | 9 | 3 | 5506 | 1337 | 7.8022 | 67 |
| 27-20.1023 | 234 484 2576 | 1023 | 24 | 18 | 16 | 15 | 0 | 18 | 0 | 6 | 3 | 0 | 0 | 0 | 0 | 127 | 24 | 9 | 4 | 5507 | 1425 | 7.8195 | 2110 |
| 27-20.1221 | 237 472 2543 | 1221 | 24 | 12 | 12 | 36 | 0 | 0 | 1 | 12 | 0 | 2 | 0 | 0 | 0 | 126 | 24 | 10 | 5 | 5508 | 4315 | 7.8212 | 2635 |
| 27-20.1 | 180 690 2200 | 1 | 0 | 15 | 55 | 0 | 12 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 0 | 6 | 6 | 7696 | 1 | 7.7798 | 1 |
| 27-20.3 | 196 646 2152 | 3 | 0 | 29 | 41 | 0 | 4 | 18 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 0 | 7 | 7 | 7698 | 3 | 7.7920 | 5 |
| 27-20.7 | 200 630 2172 | 7 | 5 | 20 | 45 | 0 | 7 | 11 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 5 | 7 | 8 | 7316 | 4 | 7.7948 | 8 |
| 27-20.14 | 208 566 2488 | 14 | 20 | 2 | 33 | 6 | 28 | 6 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 125 | 20 | 10 | 9 | 5541 | 3728 | 7.7992 | 16 |
| 27-20.16 | 210 546 2512 | 16 | 18 | 9 | 28 | 9 | 18 | 13 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 125 | 18 | 9 | 10 | 5651 | 1330 | 7.7993 | 19 |

k = 27, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($W_4$,…) | | | wlp rank | alp | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27-20.8067 | 435 | 80 | 5440 | 8067 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 21 | 0 | 0 | 0 | 109 | 51 | 10 | 8029 | 1 | 6112 | 8.0318 | 8067 |
| 27-20.8068 | 435 | 80 | 5440 | 8068 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 21 | 0 | 0 | 0 | 109 | 51 | 10 | 8030 | 2 | 6113 | 8.0319 | 8068 |
| 27-20.8069 | 436 | 79 | 5430 | 8069 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 15 | 3 | 0 | 0 | 109 | 51 | 11 | 8031 | 3 | 7511 | 8.0327 | 8069 |
| 27-20.8070 | 436 | 80 | 5430 | 8070 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 15 | 3 | 0 | 0 | 109 | 51 | 11 | 8032 | 4 | 7512 | 8.0329 | 8070 |
| 27-20.8071 | 437 | 78 | 5422 | 8071 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 9 | 6 | 0 | 0 | 109 | 51 | 11 | 8033 | 5 | 7513 | 8.0337 | 8071 |
| 27-20.8072 | 437 | 79 | 5422 | 8072 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 9 | 6 | 0 | 0 | 109 | 51 | 11 | 8034 | 6 | 7514 | 8.0338 | 8072 |
| 27-20.8073 | 438 | 78 | 5412 | 8073 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 6 | 6 | 1 | 0 | 109 | 51 | 12 | 8035 | 7 | 7994 | 8.0347 | 8073 |
| 27-20.8074 | 438 | 80 | 5412 | 8074 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 6 | 6 | 1 | 0 | 109 | 51 | 12 | 8036 | 8 | 7995 | 8.0349 | 8074 |
| 27-20.8075 | 442 | 76 | 5376 | 8075 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 7 | 0 | 109 | 51 | 12 | 8037 | 9 | 7996 | 8.0385 | 8075 |
| 27-20.8042 | 374 | 141 | 4468 | 8042 | 38 | 18 | 0 | 0 | 0 | 0 | 0 | 6 | 21 | 4 | 0 | 0 | 0 | 114 | 38 | 10 | 7690 | 10 | 6106 | 7.9572 | 8042 |

k = 27, Designs sorted based on minimizing Lmax

| Design | wlp($W_4$,…) | | | wlp rank | alp | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27-20.1 | 180 | 690 | 2200 | 1 | 0 | 15 | 55 | 0 | 12 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 0 | 6 | 6 | 7696 | 1 | 7.7798 | 1 |
| 27-20.1043 | 235 | 280 | 3647 | 1043 | 26 | 0 | 0 | 10 | 27 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 26 | 6 | 1650 | 2152 | 2 | 7.8063 | 252 |
| 27-20.3 | 196 | 646 | 2152 | 3 | 0 | 29 | 41 | 0 | 4 | 18 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 0 | 7 | 7 | 7698 | 3 | 7.7920 | 5 |
| 27-20.7 | 200 | 630 | 2172 | 7 | 5 | 20 | 45 | 0 | 7 | 11 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 5 | 7 | 8 | 7316 | 4 | 7.7948 | 8 |
| 27-20.1192 | 237 | 278 | 3632 | 1192 | 26 | 0 | 0 | 13 | 24 | 22 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 26 | 7 | 1651 | 2153 | 5 | 7.8082 | 378 |
| 27-20.1235 | 238 | 277 | 3624 | 1235 | 26 | 0 | 1 | 10 | 30 | 15 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 26 | 7 | 1652 | 2154 | 6 | 7.8091 | 437 |
| 27-20.1298b | 239 | 276 | 3616 | 1298 | 26 | 0 | 0 | 16 | 21 | 19 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 26 | 7 | 1655 | 2157 | 7 | 7.8100 | 490 |
| 27-20.1298a | 239 | 276 | 3616 | 1298 | 26 | 0 | 2 | 11 | 24 | 20 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 26 | 7 | 1655 | 2157 | 7 | 7.8100 | 490 |
| 27-20.1300 | 239 | 276 | 3619 | 1300 | 26 | 0 | 0 | 16 | 21 | 19 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 26 | 7 | 1657 | 2159 | 9 | 7.8100 | 497 |
| 27-20.1301 | 239 | 277 | 3614 | 1301 | 26 | 0 | 1 | 14 | 21 | 21 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 26 | 7 | 1658 | 2160 | 10 | 7.8101 | 499 |

k = 27, Design generators

| Design | Design Generators |
|---|---|
| 27-20.1 | 7 11 19 30 38 47 52 57 58 69 73 79 82 84 93 97 98 108 119 120 |
| 27-20.2 | 7 11 19 29 30 38 41 49 60 78 82 87 91 97 98 100 109 117 118 120 |
| 27-20.3 | 7 11 19 29 37 41 49 50 55 59 77 78 87 91 97 98 111 116 120 125 |
| 27-20.4a | 7 11 19 29 30 38 41 49 60 78 82 84 87 91 97 98 100 109 118 120 |
| 27-20.4b | 7 11 19 29 30 37 38 41 49 60 78 82 87 91 97 98 100 109 118 120 |
| 27-20.6 | 7 11 19 29 37 41 44 59 69 73 76 82 87 94 99 106 111 117 118 120 |
| 27-20.7 | 7 11 19 30 38 47 52 57 58 69 70 73 79 82 84 93 97 98 119 120 |
| 27-20.8 | 7 11 19 29 37 41 44 50 55 59 62 73 76 85 86 91 99 102 120 125 |
| 27-20.9 | 7 11 13 14 19 38 47 57 58 69 82 84 91 93 105 108 113 119 120 126 |
| 27-20.10 | 7 11 19 29 37 41 44 59 73 76 82 87 91 94 99 106 111 117 118 120 |
| 27-20.11 | 7 11 19 29 35 37 38 41 44 50 55 69 73 82 92 95 100 103 120 125 |
| 27-20.12 | 7 11 19 30 38 47 52 57 69 70 73 79 82 84 93 97 98 110 119 120 |
| 27-20.13 | 7 11 13 14 19 21 22 35 38 47 62 73 76 79 81 101 116 120 123 125 |
| 27-20.14 | 7 11 19 29 30 41 50 63 77 86 88 101 102 104 107 112 115 121 122 124 |
| 27-20.15 | 7 11 19 29 37 38 41 44 50 55 67 69 70 89 97 103 109 118 120 123 |
| 27-20.16 | 7 27 29 30 35 37 38 41 49 67 69 74 76 79 104 112 121 122 124 127 |
| 27-20.17 | 7 11 13 14 19 21 22 41 50 61 73 84 91 99 101 111 113 119 120 126 |
| 27-20.18a | 7 11 19 29 30 37 38 44 55 57 70 73 74 92 97 98 103 117 118 120 |
| 27-20.18b | 7 11 19 29 30 35 45 53 54 57 60 67 69 73 82 92 98 111 119 120 |
| 27-20.20 | 7 11 19 29 30 37 38 44 52 57 70 73 74 92 97 98 103 117 118 120 |
| 27-20.23 | 7 11 19 29 30 35 37 38 41 42 50 60 63 69 73 76 113 116 120 125 |
| 27-20.1023 | 7 11 13 21 26 47 51 54 78 81 100 104 107 109 112 117 121 122 124 127 |
| 27-20.1043 | 7 11 21 26 35 37 41 52 59 61 74 79 86 100 103 104 112 121 122 124 |
| 27-20.1192 | 7 11 21 26 35 37 41 52 56 59 74 79 86 100 103 104 112 121 122 124 |
| 27-20.1221 | 7 11 13 14 19 38 57 60 73 85 95 101 106 113 114 116 119 120 125 126 |
| 27-20.1235 | 7 11 19 21 26 35 37 41 52 59 74 79 86 100 103 104 112 121 122 124 |
| 27-20.1298a | 7 11 21 26 35 37 41 52 59 74 79 86 88 100 103 104 112 121 122 124 |
| 27-20.1298b | 7 11 21 26 31 35 45 62 70 73 74 82 94 97 104 112 117 121 122 124 |
| 27-20.1300 | 7 19 25 28 38 47 49 61 67 69 78 81 91 100 103 107 112 121 122 124 |
| 27-20.1301 | 7 14 19 25 28 31 37 38 42 47 52 70 75 81 93 104 112 121 122 124 |
| 27-20.8042 | 7 19 21 30 35 37 38 49 50 55 67 69 70 76 81 87 98 112 117 118 |
| 27-20.8067 | 7 19 21 22 35 37 38 49 52 67 69 70 81 87 97 98 111 112 115 117 |
| 27-20.8068 | 7 19 21 22 35 37 38 49 52 67 69 70 81 87 97 98 100 111 112 115 |
| 27-20.8069 | 7 19 21 22 35 37 38 49 50 52 67 69 70 81 87 97 98 111 112 115 |
| 27-20.8070 | 7 19 21 22 35 37 38 49 50 67 69 70 81 82 87 97 100 111 112 115 |
| 27-20.8071 | 7 19 21 22 35 37 38 49 50 67 69 70 81 82 84 87 97 111 112 117 |
| 27-20.8072 | 7 19 21 22 35 37 38 49 50 67 69 70 81 82 84 87 97 100 111 112 |
| 27-20.8073 | 7 19 21 22 35 37 38 49 50 52 67 69 70 81 82 84 87 97 111 112 |
| 27-20.8074 | 7 19 21 22 35 37 38 49 55 67 69 70 81 82 84 87 112 117 118 123 |
| 27-20.8075 | 7 19 21 22 35 37 38 49 50 52 55 67 69 84 87 100 103 105 112 115 |

k = 28, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28-21.1 | 210 840 2800 | 1 | 0 | 0 | 70 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 0 | 6 | 2 | 3930 | 1 | 7.0617 | 1 |
| 28-21.2 | 230 780 2752 | 2 | 0 | 15 | 55 | 0 | 0 | 13 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 0 | 7 | 3 | 3931 | 2 | 7.0751 | 2 |
| 28-21.3 | 238 717 2976 | 3 | 0 | 30 | 6 | 33 | 15 | 2 | 0 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 9 | 9 | 3932 | 194 | 7.0784 | 3 |
| 28-21.4 | 241 710 2958 | 4 | 0 | 30 | 12 | 21 | 22 | 1 | 0 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 9 | 10 | 3933 | 195 | 7.0806 | 4 |
| 28-21.5 | 244 703 2940 | 5 | 0 | 33 | 9 | 18 | 26 | 0 | 0 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 9 | 11 | 3934 | 196 | 7.0827 | 5 |
| 28-21.6 | 248 674 2960 | 6 | 0 | 1 | 17 | 52 | 8 | 2 | 0 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3649 | 3935 | 1200 | 7.0840 | 9 |
| 28-21.7 | 248 675 2959 | 7 | 0 | 1 | 19 | 46 | 14 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3650 | 3936 | 1201 | 7.0840 | 10 |
| 28-21.8 | 248 676 2960 | 8 | 0 | 1 | 17 | 52 | 8 | 2 | 0 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3651 | 3937 | 1202 | 7.0842 | 11 |
| 28-21.9a | 249 674 2949 | 9 | 0 | 1 | 21 | 42 | 16 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 115 | 0 | 11 | 3652 | 3938 | 2300 | 7.0848 | 18 |
| 28-21.9b | 249 674 2949 | 9 | 0 | 1 | 21 | 42 | 16 | 0 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3652 | 3938 | 1203 | 7.0848 | 16 |
| 28-21.9c | 249 674 2949 | 9 | 0 | 1 | 19 | 48 | 10 | 2 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3652 | 3938 | 1203 | 7.0848 | 16 |
| 28-21.12 | 249 675 2948 | 12 | 0 | 1 | 21 | 42 | 16 | 0 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3655 | 3941 | 1205 | 7.0849 | 20 |
| 28-21.13 | 249 675 2948 | 13 | 0 | 4 | 12 | 51 | 13 | 0 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3656 | 3942 | 1206 | 7.0849 | 21 |
| 28-21.14 | 249 675 2950 | 14 | 0 | 1 | 21 | 42 | 16 | 0 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3657 | 3943 | 1207 | 7.0850 | 22 |
| 28-21.15a | 249 676 2949 | 15 | 0 | 1 | 21 | 42 | 16 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 115 | 0 | 11 | 3658 | 3944 | 2301 | 7.0850 | 24 |
| 28-21.15b | 249 676 2949 | 15 | 0 | 1 | 21 | 42 | 16 | 0 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3658 | 3944 | 1208 | 7.0850 | 24 |
| 28-21.15c | 249 676 2949 | 15 | 0 | 1 | 19 | 48 | 10 | 2 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 115 | 0 | 10 | 3658 | 3944 | 1208 | 7.0850 | 24 |
| 28-21.18 | 250 648 3232 | 18 | 18 | 3 | 34 | 0 | 18 | 22 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 126 | 18 | 10 | 4 | 2855 | 1210 | 7.0852 | 27 |
| 28-21.19 | 250 672 2940 | 19 | 0 | 1 | 17 | 56 | 0 | 6 | 0 | 1 | 4 | 1 | 1 | 0 | 0 | 0 | 115 | 0 | 11 | 3661 | 3947 | 2302 | 7.0856 | 28 |

k = 28, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28-21.1157 | 290 536 3320 | 1157 | 24 | 12 | 0 | 48 | 0 | 0 | 0 | 1 | 12 | 0 | 2 | 0 | 0 | 0 | 127 | 24 | 11 | 1 | 2830 | 2771 | 7.1145 | 2583 |
| 28-21.1 | 210 840 2800 | 1 | 0 | 0 | 70 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 0 | 6 | 2 | 3930 | 1 | 7.0617 | 1 |
| 28-21.2 | 230 780 2752 | 2 | 0 | 15 | 55 | 0 | 0 | 13 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 0 | 7 | 3 | 3931 | 2 | 7.0751 | 2 |
| 28-21.18 | 250 648 3232 | 18 | 18 | 3 | 34 | 0 | 18 | 22 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 126 | 18 | 10 | 4 | 2855 | 1210 | 7.0852 | 27 |
| 28-21.58 | 254 644 3192 | 58 | 18 | 3 | 34 | 6 | 12 | 16 | 6 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 126 | 18 | 10 | 5 | 2856 | 1217 | 7.0885 | 73 |
| 28-21.172 | 260 618 3208 | 172 | 18 | 6 | 31 | 9 | 9 | 10 | 12 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 126 | 18 | 10 | 6 | 2857 | 1235 | 7.0919 | 175 |
| 28-21.2961 | 308 474 3656 | 2961 | 27 | 6 | 34 | 0 | 0 | 7 | 9 | 9 | 0 | 6 | 0 | 0 | 0 | 0 | 126 | 27 | 10 | 7 | 2398 | 1872 | 7.1290 | 3555 |
| 28-21.3388 | 314 456 3680 | 3388 | 27 | 6 | 34 | 0 | 0 | 16 | 0 | 0 | 9 | 6 | 0 | 0 | 0 | 0 | 126 | 27 | 10 | 8 | 2602 | 2050 | 7.1334 | 3705 |
| 28-21.3 | 238 717 2976 | 3 | 0 | 30 | 6 | 33 | 15 | 2 | 0 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 9 | 9 | 3932 | 194 | 7.0784 | 3 |
| 28-21.4 | 241 710 2958 | 4 | 0 | 30 | 12 | 21 | 22 | 1 | 0 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 124 | 0 | 9 | 10 | 3933 | 195 | 7.0806 | 4 |

k = 28, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28-21.4280 | 515 | 90 | 7062 | 4280 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 15 | 0 | 0 | 0 | 112 | 53 | 11 | 4231 | 1 | 3461 | 7.3351 | 4280 |
| 28-21.4281 | 515 | 90 | 7063 | 4281 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 15 | 0 | 0 | 0 | 112 | 53 | 11 | 4232 | 2 | 3462 | 7.3351 | 4281 |
| 28-21.4282 | 516 | 89 | 7052 | 4282 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 9 | 3 | 0 | 0 | 112 | 53 | 12 | 4233 | 3 | 4084 | 7.3359 | 4282 |
| 28-21.4283 | 516 | 90 | 7052 | 4283 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 9 | 3 | 0 | 0 | 112 | 53 | 12 | 4234 | 4 | 4085 | 7.3360 | 4283 |
| 28-21.4284 | 518 | 88 | 7032 | 4284 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 6 | 1 | 0 | 112 | 53 | 13 | 4235 | 5 | 4264 | 7.3376 | 4284 |
| 28-21.4268 | 445 | 160 | 5830 | 4268 | 37 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 20 | 1 | 0 | 0 | 0 | 116 | 37 | 11 | 3643 | 6 | 3456 | 7.2563 | 4268 |
| 28-21.4269 | 445 | 160 | 5831 | 4269 | 37 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 20 | 1 | 0 | 0 | 0 | 116 | 37 | 11 | 3644 | 7 | 3457 | 7.2564 | 4269 |
| 28-21.4270 | 446 | 159 | 5821 | 4270 | 37 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 14 | 4 | 0 | 0 | 0 | 116 | 37 | 11 | 3645 | 8 | 3458 | 7.2572 | 4270 |
| 28-21.4271 | 446 | 160 | 5820 | 4271 | 37 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 14 | 4 | 0 | 0 | 0 | 116 | 37 | 11 | 3646 | 9 | 3459 | 7.2572 | 4271 |

k = 28, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28-21.1 | 210 | 840 | 2800 | 1 | 0 | 0 | 70 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 0 | 6 | 2 | 3930 | 1 | 7.0617 | 1 |
| 28-21.2 | 230 | 780 | 2752 | 2 | 0 | 15 | 55 | 0 | 0 | 13 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 0 | 7 | 3 | 3931 | 2 | 7.0751 | 2 |
| 28-21.681 | 280 | 325 | 4653 | 681 | 27 | 0 | 0 | 5 | 21 | 26 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 27 | 7 | 787 | 876 | 3 | 7.0927 | 213 |
| 28-21.732 | 282 | 323 | 4637 | 732 | 27 | 0 | 0 | 7 | 21 | 20 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 27 | 7 | 789 | 877 | 4 | 7.0944 | 275 |
| 28-21.795 | 284 | 321 | 4621 | 795 | 27 | 0 | 0 | 11 | 15 | 20 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 27 | 7 | 797 | 883 | 5 | 7.0960 | 343 |
| 28-21.733 | 282 | 323 | 4640 | 733 | 27 | 0 | 0 | 6 | 21 | 26 | 6 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 27 | 8 | 790 | 878 | 6 | 7.0944 | 276 |
| 28-21.772 | 283 | 322 | 4630 | 772 | 27 | 0 | 1 | 4 | 24 | 22 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 27 | 8 | 794 | 880 | 7 | 7.0952 | 307 |
| 28-21.773 | 283 | 322 | 4631 | 773 | 27 | 0 | 0 | 7 | 21 | 23 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 27 | 8 | 795 | 881 | 8 | 7.0952 | 308 |
| 28-21.794 | 284 | 321 | 4621 | 794 | 27 | 0 | 1 | 6 | 22 | 19 | 12 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 27 | 8 | 796 | 882 | 9 | 7.0960 | 343 |
| 28-21.796 | 284 | 321 | 4621 | 796 | 27 | 0 | 2 | 4 | 21 | 24 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 27 | 8 | 798 | 884 | 10 | 7.0960 | 343 |

k = 28, Design generators

| Design | Design Generators |
|---|---|
| 28-21.1 | 7 11 19 30 38 47 52 57 58 69 73 79 82 84 93 97 98 108 119 120 126 |
| 28-21.2 | 7 11 19 30 38 47 52 57 58 69 70 73 79 82 84 93 97 98 108 119 120 |
| 28-21.3 | 7 11 19 29 37 38 41 44 50 55 67 69 70 89 92 97 103 109 118 120 123 |
| 28-21.4 | 7 11 19 29 37 41 44 50 55 59 62 73 76 85 86 91 99 102 106 120 125 |
| 28-21.5 | 7 11 13 14 19 21 22 25 35 38 47 62 73 76 79 81 101 116 120 123 125 |
| 28-21.6 | 7 11 13 14 19 21 22 38 41 50 52 59 73 79 84 93 99 101 108 119 120 |
| 28-21.7 | 7 11 19 29 30 35 44 52 57 67 69 73 74 81 95 97 100 103 118 120 123 |
| 28-21.8 | 7 11 13 14 19 21 22 38 41 50 52 59 70 73 84 93 99 101 108 119 120 |
| 28-21.9a | 7 11 13 19 22 26 28 38 41 47 50 73 79 82 84 93 99 106 108 120 126 |
| 28-21.9b | 7 11 19 29 30 35 38 41 50 60 77 78 86 89 90 95 97 116 119 120 126 |
| 28-21.9c | 7 11 19 29 30 38 41 42 49 50 60 67 69 70 76 90 97 103 117 118 120 |
| 28-21.12 | 7 11 19 29 30 35 45 53 57 58 63 73 74 92 97 108 111 116 120 123 125 |
| 28-21.13 | 7 11 19 29 35 45 46 53 54 57 60 67 69 70 76 84 89 90 100 120 126 |
| 28-21.14 | 7 11 19 29 38 41 42 49 60 67 77 78 85 86 89 90 95 97 98 120 125 |
| 28-21.15a | 7 11 13 19 22 26 28 38 41 47 50 73 79 82 84 93 106 108 113 120 126 |
| 28-21.15b | 7 11 19 29 30 35 38 41 49 60 77 78 86 89 90 95 97 116 119 120 126 |
| 28-21.15c | 7 11 19 29 30 38 41 42 49 50 60 67 69 70 90 97 103 109 117 118 120 |
| 28-21.18 | 7 11 19 29 30 38 41 44 70 74 81 82 101 104 107 112 115 121 122 124 127 |
| 28-21.19 | 7 11 13 14 19 21 22 38 41 50 61 73 79 82 91 99 101 113 119 120 126 |
| 28-21.58 | 7 11 19 25 26 28 31 35 45 46 53 54 59 69 73 76 79 84 113 120 125 |
| 28-21.172 | 7 11 19 29 30 37 41 44 47 67 69 70 73 82 92 95 109 110 113 116 120 |
| 28-21.681 | 7 11 21 26 35 37 41 52 59 61 74 79 86 88 100 103 104 112 121 122 124 |
| 28-21.732 | 7 11 13 21 26 35 37 41 52 59 74 79 86 88 100 103 104 112 121 122 124 |
| 28-21.733 | 7 11 19 21 26 35 37 41 52 56 59 74 79 86 100 103 104 112 121 122 124 |
| 28-21.772 | 7 11 19 21 26 28 35 41 52 59 62 73 79 86 91 97 100 112 121 122 124 |
| 28-21.773 | 7 11 21 22 26 31 35 45 52 67 70 73 79 88 94 97 104 112 121 122 124 |
| 28-21.794 | 7 11 21 26 31 41 44 47 50 62 67 77 84 91 104 107 112 117 121 122 124 |
| 28-21.795 | 7 11 19 21 26 28 41 44 47 50 62 67 77 84 91 104 112 117 121 122 124 |
| 28-21.796 | 7 11 19 21 26 28 35 37 41 52 59 73 79 86 91 97 100 112 121 122 124 |
| 28-21.1157 | 7 11 13 14 19 38 57 60 73 85 95 101 106 113 114 116 119 120 123 125 126 |
| 28-21.2961 | 7 11 13 14 19 22 31 35 37 38 41 42 44 49 59 62 69 89 109 119 120 |
| 28-21.3388 | 7 11 13 19 21 25 26 46 54 63 91 97 98 103 104 107 112 115 121 122 124 |
| 28-21.4268 | 7 19 21 30 35 37 38 49 50 55 67 69 70 76 81 87 98 103 112 117 118 |
| 28-21.4269 | 7 19 21 22 35 37 38 49 50 56 67 69 70 81 84 98 100 111 112 115 118 |
| 28-21.4270 | 7 19 21 22 35 37 38 49 50 52 56 67 69 70 81 84 98 111 112 115 118 |
| 28-21.4271 | 7 19 21 22 35 37 38 41 49 52 67 69 70 81 84 87 97 112 117 118 123 |
| 28-21.4280 | 7 19 21 22 35 37 38 49 50 52 67 69 70 81 87 97 98 100 111 112 115 |
| 28-21.4281 | 7 19 21 22 35 37 38 49 50 67 69 70 81 82 84 87 97 100 111 112 118 |
| 28-21.4282 | 7 19 21 22 35 37 38 49 50 52 67 69 70 81 82 84 87 97 98 111 112 |
| 28-21.4283 | 7 19 21 22 35 37 38 49 50 52 67 69 70 81 82 84 87 97 111 112 118 |
| 28-21.4284 | 7 19 21 22 35 37 38 49 50 52 55 67 69 70 81 82 84 87 97 111 112 |

k = 29, Designs sorted based on word length pattern

| Design | wlp($w_4$,...) | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29-22.1 | 266 945 3472 | 1 | 0 | 0 | 70 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 0 | 7 | 1 | 1914 | 1 | 6.4312 | 1 |
| 29-22.2 | 287 823 3819 | 2 | 0 | 30 | 0 | 30 | 21 | 4 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 125 | 0 | 9 | 4 | 1915 | 20 | 6.4414 | 2 |
| 29-22.3 | 289 810 3744 | 3 | 0 | 0 | 8 | 48 | 24 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 116 | 0 | 10 | 1792 | 1916 | 261 | 6.4415 | 3 |
| 29-22.4 | 290 810 3733 | 4 | 0 | 0 | 10 | 44 | 26 | 0 | 0 | 0 | 1 | 5 | 1 | 0 | 0 | 0 | 116 | 0 | 11 | 1793 | 1917 | 791 | 6.4423 | 5 |
| 29-22.5 | 290 810 3734 | 5 | 0 | 0 | 8 | 50 | 20 | 2 | 0 | 0 | 1 | 5 | 1 | 0 | 0 | 0 | 116 | 0 | 11 | 1794 | 1918 | 792 | 6.4423 | 6 |
| 29-22.6 | 290 816 3798 | 6 | 0 | 30 | 6 | 18 | 27 | 5 | 0 | 0 | 9 | 1 | 0 | 0 | 0 | 0 | 125 | 0 | 10 | 5 | 1919 | 262 | 6.4432 | 14 |
| 29-22.7a | 291 808 3724 | 7 | 0 | 0 | 10 | 46 | 22 | 2 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 116 | 0 | 11 | 1795 | 1920 | 793 | 6.4430 | 9 |
| 29-22.7b | 291 808 3724 | 7 | 0 | 0 | 8 | 52 | 16 | 4 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 116 | 0 | 11 | 1795 | 1920 | 793 | 6.4430 | 9 |
| 29-22.9a | 291 810 3722 | 9 | 0 | 0 | 10 | 46 | 22 | 2 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 116 | 0 | 11 | 1797 | 1922 | 795 | 6.4431 | 11 |
| 29-22.9b | 291 810 3722 | 9 | 0 | 0 | 12 | 40 | 28 | 0 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 116 | 0 | 11 | 1797 | 1922 | 795 | 6.4431 | 11 |
| 29-22.11 | 291 810 3723 | 11 | 0 | 0 | 12 | 40 | 28 | 0 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 116 | 0 | 11 | 1799 | 1924 | 797 | 6.4431 | 13 |
| 29-22.12a | 291 812 3724 | 12 | 0 | 0 | 10 | 46 | 22 | 2 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 116 | 0 | 11 | 1800 | 1925 | 798 | 6.4433 | 15 |
| 29-22.12b | 291 812 3724 | 12 | 0 | 0 | 8 | 52 | 16 | 4 | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 116 | 0 | 11 | 1800 | 1925 | 798 | 6.4433 | 15 |
| 29-22.14a | 292 808 3714 | 14 | 0 | 0 | 8 | 54 | 12 | 6 | 0 | 0 | 2 | 4 | 0 | 1 | 0 | 0 | 116 | 0 | 12 | 1803 | 1927 | 1266 | 6.4438 | 19 |
| 29-22.14b | 292 808 3714 | 14 | 0 | 0 | 12 | 42 | 24 | 2 | 0 | 0 | 2 | 4 | 0 | 1 | 0 | 0 | 116 | 0 | 12 | 1802 | 1928 | 1265 | 6.4438 | 18 |
| 29-22.16a | 292 810 3712 | 16 | 0 | 0 | 12 | 42 | 24 | 2 | 0 | 0 | 2 | 4 | 0 | 1 | 0 | 0 | 116 | 0 | 12 | 1804 | 1929 | 1267 | 6.4439 | 20 |
| 29-22.16b | 292 810 3712 | 16 | 0 | 0 | 12 | 42 | 24 | 2 | 0 | 0 | 3 | 1 | 3 | 0 | 0 | 0 | 116 | 0 | 11 | 1804 | 1929 | 800 | 6.4439 | 20 |
| 29-22.18 | 292 810 3715 | 18 | 0 | 0 | 14 | 36 | 30 | 0 | 0 | 0 | 3 | 1 | 3 | 0 | 0 | 0 | 116 | 0 | 11 | 1806 | 1931 | 801 | 6.4440 | 22 |
| 29-22.19 | 292 812 3714 | 19 | 0 | 0 | 8 | 54 | 12 | 6 | 0 | 0 | 2 | 4 | 0 | 1 | 0 | 0 | 116 | 0 | 12 | 1807 | 1932 | 1268 | 6.4441 | 23 |

k = 29, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,...) | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29-22.1 | 266 945 3472 | 1 | 0 | 0 | 70 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 0 | 7 | 1 | 1914 | 1 | 6.4312 | 1 |
| 29-22.114 | 306 729 4096 | 114 | 18 | 0 | 37 | 0 | 18 | 0 | 22 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 127 | 18 | 11 | 2 | 1407 | 834 | 6.4515 | 121 |
| 29-22.1725 | 370 537 4736 | 1725 | 27 | 0 | 40 | 0 | 0 | 0 | 16 | 0 | 9 | 0 | 6 | 0 | 0 | 0 | 127 | 27 | 11 | 3 | 1400 | 1146 | 6.4964 | 1878 |
| 29-22.2 | 287 823 3819 | 2 | 0 | 30 | 0 | 30 | 21 | 4 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 125 | 0 | 9 | 4 | 1915 | 20 | 6.4414 | 2 |
| 29-22.6 | 290 816 3798 | 6 | 0 | 30 | 6 | 18 | 27 | 5 | 0 | 0 | 9 | 1 | 0 | 0 | 0 | 0 | 125 | 0 | 10 | 5 | 1919 | 262 | 6.4432 | 14 |
| 29-22.147 | 309 740 3963 | 147 | 8 | 22 | 4 | 24 | 23 | 0 | 5 | 0 | 4 | 6 | 0 | 0 | 0 | 0 | 125 | 8 | 10 | 6 | 1661 | 265 | 6.4544 | 180 |
| 29-22.152 | 310 712 4156 | 152 | 12 | 15 | 18 | 3 | 24 | 11 | 1 | 9 | 0 | 0 | 3 | 0 | 0 | 0 | 125 | 12 | 11 | 7 | 1473 | 843 | 6.4540 | 163 |
| 29-22.181 | 312 704 4148 | 181 | 12 | 15 | 18 | 7 | 16 | 16 | 0 | 8 | 1 | 0 | 3 | 0 | 0 | 0 | 125 | 12 | 11 | 8 | 1474 | 850 | 6.4550 | 191 |
| 29-22.182 | 312 710 4134 | 182 | 12 | 15 | 18 | 7 | 16 | 16 | 0 | 8 | 1 | 0 | 3 | 0 | 0 | 0 | 125 | 12 | 11 | 9 | 1475 | 851 | 6.4554 | 205 |
| 29-22.224 | 315 700 4132 | 224 | 14 | 11 | 20 | 11 | 8 | 20 | 0 | 9 | 0 | 0 | 2 | 1 | 0 | 0 | 125 | 14 | 12 | 10 | 1444 | 1369 | 6.4572 | 267 |

k = 29, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29-22.2147 | 605 101 9075 | 2147 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 10 | 0 | 0 | 115 | 55 | 12 | 2112 | 1 | 1839 | 6.7120 | 2147 |
| 29-22.2148 | 606 100 9064 | 2148 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 4 | 3 | 0 | 115 | 55 | 13 | 2113 | 2 | 2093 | 6.7127 | 2148 |
| 29-22.2149 | 606 101 9064 | 2149 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 4 | 3 | 0 | 115 | 55 | 13 | 2114 | 3 | 2094 | 6.7128 | 2149 |
| 29-22.2140 | 526 180 7522 | 2140 | 36 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 14 | 1 | 0 | 0 | 118 | 36 | 12 | 1782 | 4 | 1835 | 6.6300 | 2140 |
| 29-22.2141 | 526 180 7524 | 2141 | 36 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 14 | 1 | 0 | 0 | 118 | 36 | 12 | 1783 | 5 | 1836 | 6.6301 | 2141 |
| 29-22.2142 | 527 179 7513 | 2142 | 36 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 8 | 4 | 0 | 0 | 118 | 36 | 12 | 1784 | 6 | 1837 | 6.6308 | 2142 |
| 29-22.2143 | 527 180 7512 | 2143 | 36 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 8 | 4 | 0 | 0 | 118 | 36 | 12 | 1785 | 7 | 1838 | 6.6309 | 2143 |
| 29-22.1912 | 384 322 5626 | 1912 | 35 | 0 | 0 | 0 | 6 | 31 | 11 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 119 | 35 | 12 | 1525 | 8 | 1739 | 6.4940 | 1853 |
| 29-22.1917 | 385 321 5615 | 1917 | 35 | 0 | 0 | 0 | 8 | 28 | 11 | 1 | 0 | 0 | 6 | 1 | 0 | 0 | 119 | 35 | 12 | 1526 | 9 | 1740 | 6.4947 | 1860 |
| 29-22.1936 | 389 317 5619 | 1936 | 35 | 0 | 0 | 0 | 16 | 12 | 20 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 119 | 35 | 12 | 1538 | 10 | 1745 | 6.4980 | 1899 |

k = 29, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29-22.1 | 266 945 3472 | 1 | 0 | 0 | 70 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 0 | 7 | 1 | 1914 | 1 | 6.4312 | 1 |
| 29-22.379 | 330 376 5894 | 379 | 28 | 0 | 0 | 3 | 10 | 32 | 12 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 28 | 8 | 373 | 333 | 2 | 6.4526 | 136 |
| 29-22.390 | 331 375 5885 | 390 | 28 | 0 | 0 | 2 | 18 | 17 | 22 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 28 | 8 | 374 | 334 | 3 | 6.4533 | 144 |
| 29-22.405 | 332 374 5876 | 405 | 28 | 0 | 0 | 4 | 13 | 23 | 17 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 28 | 8 | 376 | 336 | 4 | 6.4540 | 164 |
| 29-22.424 | 333 373 5871 | 424 | 28 | 0 | 0 | 3 | 17 | 20 | 15 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 28 | 8 | 378 | 338 | 5 | 6.4548 | 184 |
| 29-22.432b | 334 372 5856 | 432 | 28 | 0 | 0 | 5 | 12 | 26 | 10 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 28 | 8 | 379 | 340 | 6 | 6.4555 | 206 |
| 29-22.434b | 334 372 5862 | 434 | 28 | 0 | 0 | 5 | 14 | 20 | 16 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 28 | 8 | 381 | 342 | 7 | 6.4555 | 208 |

k = 29, Design generators

| Design | Design Generators |
|---|---|
| 29-22.1 | 7 11 19 30 38 47 52 57 58 69 70 73 79 82 84 93 97 98 108 119 120 126 |
| 29-22.2 | 7 11 19 29 35 37 38 57 63 69 70 73 79 81 87 97 98 103 109 117 120 123 |
| 29-22.3 | 7 11 19 29 30 35 44 52 57 67 69 73 74 81 95 97 100 103 109 118 120 123 |
| 29-22.4 | 7 11 19 29 38 41 42 49 60 67 77 78 85 86 89 90 95 97 98 108 120 125 |
| 29-22.5 | 7 11 19 29 30 35 45 49 52 56 73 79 85 86 102 104 112 115 121 122 124 127 |
| 29-22.6 | 7 11 19 29 37 41 44 50 55 59 62 73 76 85 86 91 99 102 106 111 120 125 |
| 29-22.7a | 7 11 19 29 30 35 41 44 47 54 56 67 77 78 81 84 88 104 112 121 122 124 |
| 29-22.7b | 7 11 13 14 19 28 35 44 53 57 58 67 76 85 89 90 102 105 120 123 125 126 |
| 29-22.9a | 7 11 19 29 30 35 45 46 49 52 56 73 79 85 102 104 112 115 121 122 124 127 |
| 29-22.9b | 7 11 19 29 30 35 44 52 55 57 67 69 73 74 95 97 100 103 109 118 120 123 |
| 29-22.11 | 7 11 19 21 22 25 26 35 45 46 49 60 67 77 78 81 95 101 108 116 120 123 |
| 29-22.12a | 7 11 19 29 35 45 53 54 60 67 69 70 81 82 92 97 98 111 116 120 123 125 |
| 29-22.12b | 7 11 19 29 30 35 45 54 57 60 67 69 70 73 74 81 82 95 111 116 120 125 |
| 29-22.14a | 7 11 19 29 30 35 41 47 53 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 29-22.14b | 7 11 19 29 30 35 41 44 47 53 54 56 67 78 81 84 88 104 112 121 122 124 |
| 29-22.16a | 7 11 19 29 30 35 45 49 52 56 73 79 85 88 102 104 112 115 121 122 124 127 |
| 29-22.16b | 7 11 19 29 35 38 41 42 49 60 67 77 78 85 86 89 90 95 97 98 111 120 |
| 29-22.18 | 7 11 19 29 35 45 53 54 60 67 69 70 73 81 82 92 97 98 111 116 120 123 |
| 29-22.19 | 7 11 19 30 35 41 47 53 54 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 29-22.114 | 7 11 13 19 21 35 38 57 60 67 69 70 73 76 81 84 93 98 103 110 118 120 |
| 29-22.147 | 7 11 19 29 35 37 38 57 63 67 69 70 73 79 81 97 98 103 109 117 120 123 |
| 29-22.152 | 7 11 13 19 25 26 35 38 41 42 52 67 69 73 74 87 100 103 109 114 120 123 |
| 29-22.181 | 7 11 13 21 25 31 37 41 51 61 78 86 88 97 98 100 104 112 117 121 122 124 |
| 29-22.182 | 7 11 13 21 25 28 31 37 41 51 61 78 86 88 97 98 104 112 117 121 122 124 |
| 29-22.224 | 7 11 13 14 19 21 35 38 57 60 67 69 70 74 79 81 84 93 98 103 110 120 |
| 29-22.379 | 7 11 19 21 26 28 35 37 41 52 59 62 73 79 86 91 97 100 112 121 122 124 |
| 29-22.390 | 7 14 19 22 31 35 38 41 42 50 59 62 70 77 87 98 104 112 117 121 122 124 |
| 29-22.405 | 7 11 25 31 37 38 41 47 51 61 62 76 82 93 98 103 104 112 118 121 122 124 |
| 29-22.424 | 7 11 19 21 26 28 35 41 52 56 59 62 73 79 86 91 97 100 112 121 122 124 |
| 29-22.432b | 7 11 13 21 22 44 55 62 73 74 76 79 83 93 97 98 103 104 112 121 122 124 |
| 29-22.434b | 7 11 25 31 37 38 41 47 51 61 76 82 87 93 98 103 104 112 118 121 122 124 |
| 29-22.1725 | 7 11 29 37 41 42 44 47 51 78 81 82 84 87 88 104 112 118 121 122 124 127 |
| 29-22.1912 | 7 11 19 30 35 41 42 44 47 56 59 67 81 87 88 104 112 117 121 122 124 127 |
| 29-22.1917 | 7 11 19 29 35 38 41 42 44 47 56 67 87 88 91 104 107 112 121 122 124 127 |
| 29-22.1936 | 7 11 19 30 35 41 42 44 47 56 59 74 81 82 87 88 104 115 121 122 124 127 |
| 29-22.2140 | 7 19 21 22 35 37 38 49 50 52 56 67 69 70 81 82 84 98 111 112 115 118 |
| 29-22.2141 | 7 19 21 22 35 37 38 49 50 56 67 69 70 81 84 98 100 111 112 115 117 118 |
| 29-22.2142 | 7 19 21 22 35 37 38 49 50 52 55 56 67 69 70 81 84 98 111 112 115 118 |
| 29-22.2143 | 7 19 21 22 35 37 38 52 67 69 70 81 82 84 87 88 97 98 100 111 112 115 |
| 29-22.2147 | 7 19 21 22 35 37 38 49 50 52 67 69 70 81 82 84 87 97 98 100 111 112 |
| 29-22.2148 | 7 19 21 22 35 37 38 49 50 52 55 67 69 70 81 82 84 87 97 98 111 112 |
| 29-22.2149 | 7 19 21 22 35 37 38 49 50 52 55 67 69 70 81 82 84 87 97 111 112 118 |

k = 30, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30-23.1 | 335 972 4662 | 1 | 0 | 0 | 0 | 40 | 40 | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 117 | 0 | 11 | 773 | 799 | 182 | 5.8661 | 1 |
| 30-23.2 | 336 972 4650 | 2 | 0 | 0 | 0 | 42 | 36 | 2 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | 0 | 117 | 0 | 12 | 774 | 800 | 379 | 5.8668 | 2 |
| 30-23.3 | 336 972 4651 | 3 | 0 | 0 | 0 | 42 | 36 | 2 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | 0 | 117 | 0 | 12 | 775 | 801 | 380 | 5.8668 | 3 |
| 30-23.4 | 336 972 4652 | 4 | 0 | 0 | 0 | 42 | 36 | 2 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | 0 | 117 | 0 | 12 | 776 | 802 | 381 | 5.8668 | 4 |
| 30-23.5 | 337 968 4644 | 5 | 0 | 0 | 0 | 44 | 32 | 4 | 0 | 0 | 0 | 4 | 1 | 2 | 0 | 0 | 0 | 117 | 0 | 12 | 777 | 803 | 382 | 5.8673 | 6 |
| 30-23.6 | 337 972 4640 | 6 | 0 | 0 | 0 | 44 | 32 | 4 | 0 | 0 | 0 | 4 | 1 | 2 | 0 | 0 | 0 | 117 | 0 | 12 | 778 | 804 | 383 | 5.8675 | 7 |
| 30-23.7 | 337 976 4644 | 7 | 0 | 0 | 0 | 44 | 32 | 4 | 0 | 0 | 0 | 4 | 1 | 2 | 0 | 0 | 0 | 117 | 0 | 12 | 779 | 805 | 384 | 5.8679 | 9 |
| 30-23.8 | 338 968 4633 | 8 | 0 | 0 | 0 | 46 | 28 | 6 | 0 | 0 | 0 | 4 | 2 | 0 | 1 | 0 | 0 | 117 | 0 | 13 | 780 | 806 | 586 | 5.8680 | 10 |
| 30-23.9 | 338 972 4630 | 9 | 0 | 0 | 0 | 46 | 28 | 6 | 0 | 0 | 0 | 4 | 2 | 0 | 1 | 0 | 0 | 117 | 0 | 13 | 781 | 807 | 587 | 5.8683 | 11 |
| 30-23.10 | 338 976 4633 | 10 | 0 | 0 | 0 | 46 | 28 | 6 | 0 | 0 | 0 | 4 | 2 | 0 | 1 | 0 | 0 | 117 | 0 | 13 | 782 | 808 | 588 | 5.8686 | 13 |
| 30-23.11 | 339 968 4620 | 11 | 0 | 0 | 0 | 48 | 24 | 8 | 0 | 0 | 0 | 5 | 0 | 1 | 1 | 0 | 0 | 117 | 0 | 13 | 783 | 809 | 589 | 5.8687 | 14 |
| 30-23.12 | 339 976 4620 | 12 | 0 | 0 | 0 | 48 | 24 | 8 | 0 | 0 | 0 | 5 | 0 | 1 | 1 | 0 | 0 | 117 | 0 | 13 | 784 | 810 | 590 | 5.8693 | 16 |
| 30-23.13 | 341 945 4723 | 13 | 0 | 0 | 6 | 35 | 33 | 6 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 117 | 0 | 11 | 785 | 811 | 183 | 5.8691 | 15 |
| 30-23.14 | 341 968 4600 | 14 | 0 | 0 | 0 | 52 | 16 | 12 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 117 | 0 | 14 | 786 | 812 | 863 | 5.8701 | 24 |
| 30-23.15 | 341 976 4600 | 15 | 0 | 0 | 0 | 52 | 16 | 12 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 117 | 0 | 14 | 787 | 813 | 864 | 5.8708 | 28 |
| 30-23.16 | 342 944 4712 | 16 | 0 | 0 | 6 | 37 | 29 | 8 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 0 | 117 | 0 | 12 | 788 | 814 | 385 | 5.8697 | 19 |
| 30-23.17 | 342 944 4712 | 17 | 0 | 0 | 8 | 31 | 35 | 6 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 0 | 117 | 0 | 12 | 789 | 815 | 386 | 5.8697 | 20 |
| 30-23.18 | 342 945 4711 | 18 | 0 | 0 | 8 | 31 | 35 | 6 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 0 | 117 | 0 | 12 | 790 | 816 | 387 | 5.8698 | 21 |
| 30-23.19 | 342 946 4712 | 19 | 0 | 0 | 8 | 31 | 35 | 6 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 0 | 117 | 0 | 12 | 791 | 817 | 388 | 5.8699 | 22 |
| 30-23.20 | 342 946 4712 | 20 | 0 | 0 | 6 | 37 | 29 | 8 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 0 | 117 | 0 | 12 | 792 | 818 | 389 | 5.8699 | 22 |

k = 30, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30-23.30 | 345 935 4855 | 30 | 0 | 30 | 0 | 15 | 36 | 0 | 5 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 126 | 0 | 10 | 1 | 828 | 31 | 5.8722 | 36 |
| 30-23.156 | 370 840 5068 | 156 | 8 | 22 | 0 | 18 | 33 | 0 | 0 | 5 | 0 | 4 | 6 | 0 | 0 | 0 | 0 | 126 | 8 | 11 | 2 | 635 | 188 | 5.8858 | 231 |
| 30-23.161 | 371 806 5286 | 161 | 12 | 12 | 21 | 3 | 12 | 21 | 3 | 0 | 9 | 0 | 0 | 3 | 0 | 0 | 0 | 126 | 12 | 12 | 3 | 585 | 440 | 5.8851 | 215 |
| 30-23.239 | 387 758 5398 | 239 | 14 | 10 | 24 | 0 | 17 | 16 | 0 | 3 | 2 | 7 | 0 | 3 | 0 | 0 | 0 | 126 | 14 | 12 | 4 | 572 | 454 | 5.8948 | 481 |
| 30-23.126 | 366 840 5181 | 126 | 8 | 6 | 24 | 25 | 0 | 0 | 24 | 0 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 124 | 8 | 11 | 5 | 627 | 184 | 5.8834 | 163 |
| 30-23.134 | 367 836 5172 | 134 | 8 | 6 | 24 | 25 | 0 | 3 | 18 | 3 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 124 | 8 | 11 | 6 | 630 | 185 | 5.8838 | 174 |
| 30-23.135 | 367 838 5170 | 135 | 8 | 6 | 24 | 25 | 0 | 3 | 18 | 3 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 124 | 8 | 11 | 7 | 631 | 186 | 5.8840 | 176 |
| 30-23.145 | 369 828 5192 | 145 | 8 | 6 | 24 | 25 | 0 | 7 | 11 | 6 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 124 | 8 | 11 | 8 | 632 | 187 | 5.8849 | 210 |

k = 30, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30-23.975 | 706 113 11548 | 975 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 6 | 0 | 0 | 118 | 57 | 13 | 771 | 1 | 862 | 6.1552 | 975 |
| 30-23.976 | 707 112 11536 | 976 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 3 | 0 | 118 | 57 | 14 | 772 | 2 | 961 | 6.1558 | 976 |
| 30-23.866 | 448 371 7098 | 866 | 36 | 0 | 0 | 0 | 0 | 21 | 27 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 121 | 36 | 12 | 643 | 3 | 558 | 5.9216 | 835 |
| 30-23.867 | 449 370 7086 | 867 | 36 | 0 | 0 | 0 | 0 | 24 | 21 | 3 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 121 | 36 | 12 | 644 | 4 | 559 | 5.9223 | 837 |
| 30-23.880 | 454 365 7096 | 880 | 36 | 0 | 0 | 0 | 6 | 16 | 20 | 6 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 121 | 36 | 13 | 651 | 5 | 821 | 5.9260 | 850 |
| 30-23.911 | 466 353 7148 | 911 | 36 | 0 | 0 | 5 | 3 | 16 | 16 | 3 | 5 | 0 | 0 | 4 | 3 | 0 | 0 | 121 | 36 | 13 | 673 | 6 | 829 | 5.9353 | 901 |
| 30-23.899 | 461 358 7138 | 899 | 35 | 0 | 0 | 0 | 12 | 12 | 9 | 15 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 120 | 35 | 13 | 735 | 7 | 827 | 5.9315 | 885 |

k = 30, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30-23.245c | 389 430 7378 | 245 | 29 | 0 | 0 | 0 | 15 | 16 | 13 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 29 | 8 | 146 | 129 | 1 | 5.8807 | 119 |
| 30-23.230 | 386 433 7404 | 230 | 29 | 0 | 0 | 2 | 5 | 22 | 26 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 29 | 9 | 141 | 125 | 2 | 5.8788 | 88 |
| 30-23.235 | 387 432 7396 | 235 | 29 | 0 | 0 | 1 | 9 | 21 | 18 | 12 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 29 | 9 | 141 | 126 | 3 | 5.8794 | 96 |
| 30-23.241 | 388 431 7386 | 241 | 29 | 0 | 0 | 1 | 12 | 15 | 21 | 12 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 29 | 9 | 145 | 128 | 4 | 5.8801 | 107 |
| 30-23.245a | 389 430 7378 | 245 | 29 | 0 | 0 | 3 | 6 | 22 | 19 | 9 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 29 | 9 | 146 | 129 | 5 | 5.8807 | 119 |
| 30-23.255 | 390 429 7376 | 255 | 29 | 0 | 0 | 0 | 15 | 16 | 16 | 12 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 29 | 9 | 151 | 133 | 6 | 5.8815 | 132 |

k = 30, Design generators

| Design | Design Generators |
|---|---|
| 30-23.1 | 7 11 19 21 22 25 26 35 45 46 49 60 67 77 78 81 95 101 108 116 120 123 126 |
| 30-23.2 | 7 11 19 29 30 35 45 46 49 52 56 73 79 85 88 102 104 112 115 121 122 124 127 |
| 30-23.3 | 7 11 19 21 22 25 26 35 45 46 49 60 67 77 78 81 95 101 108 116 120 123 125 |
| 30-23.4 | 7 11 19 29 30 35 41 44 47 53 54 56 67 77 78 81 84 88 104 112 121 122 124 |
| 30-23.5 | 7 11 19 29 35 45 46 53 57 58 60 67 86 92 97 98 100 103 104 107 112 115 125 |
| 30-23.6 | 7 11 19 29 30 35 45 54 57 60 67 69 70 73 74 81 82 95 97 111 116 120 125 |
| 30-23.7 | 7 19 29 30 35 49 50 52 55 56 67 79 85 86 88 101 102 104 112 115 121 122 124 |
| 30-23.8 | 7 11 19 29 35 45 46 53 57 58 60 63 67 86 97 98 100 103 104 107 112 115 125 |
| 30-23.9 | 7 11 19 29 30 35 41 47 53 54 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 30-23.10 | 7 11 19 30 35 41 47 53 54 59 77 82 84 88 101 102 104 107 112 121 122 124 127 |
| 30-23.11 | 7 11 19 29 30 35 41 47 53 54 59 78 82 84 88 102 104 107 112 121 122 124 127 |
| 30-23.12 | 7 11 13 14 19 21 22 38 41 47 50 52 73 79 82 84 91 99 101 106 113 120 126 |
| 30-23.13 | 7 11 19 29 30 35 45 49 50 52 56 73 79 85 86 102 104 112 115 121 122 124 127 |
| 30-23.14 | 7 11 19 29 30 35 41 47 53 59 78 82 84 88 101 102 104 107 112 121 122 124 127 |
| 30-23.15 | 7 11 13 14 19 21 22 38 41 47 50 52 70 73 79 84 91 99 101 106 108 120 126 |
| 30-23.16 | 7 11 19 29 30 35 41 47 53 56 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 30-23.17 | 7 11 19 29 30 35 41 44 47 53 54 56 67 78 81 84 88 104 112 121 122 124 127 |
| 30-23.18 | 7 11 19 21 22 25 26 35 45 46 49 60 67 77 78 81 95 101 105 108 116 120 123 |
| 30-23.19 | 7 11 19 29 30 35 41 44 47 53 54 56 67 77 81 84 88 104 112 121 122 124 127 |
| 30-23.20 | 7 11 19 30 35 41 47 53 54 56 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 30-23.30 | 7 11 19 29 35 37 38 57 63 67 69 70 73 79 81 87 97 98 103 109 117 120 123 |
| 30-23.126 | 7 19 21 30 35 37 38 44 49 58 67 69 73 81 84 95 98 100 103 104 112 117 126 |
| 30-23.134 | 7 11 13 19 21 25 26 28 31 35 49 52 69 81 82 106 108 111 119 120 123 125 126 |
| 30-23.135 | 7 11 13 19 21 25 26 28 31 35 38 49 67 69 82 106 108 111 119 120 123 125 126 |
| 30-23.145 | 7 11 13 14 19 21 26 35 38 63 67 69 73 74 76 79 81 82 84 100 120 123 125 |
| 30-23.156 | 7 11 19 29 35 37 38 57 63 67 69 70 73 79 81 97 98 100 103 109 117 120 123 |
| 30-23.161 | 7 11 13 14 19 25 26 35 38 41 42 52 67 69 73 74 87 100 103 109 114 120 123 |
| 30-23.230 | 7 11 13 14 21 26 31 35 37 41 52 56 59 69 79 86 97 103 104 112 121 122 124 |
| 30-23.235 | 7 11 13 14 19 31 35 38 42 49 50 52 59 67 79 85 98 104 109 112 121 122 124 |
| 30-23.239 | 7 11 14 25 26 28 31 45 53 67 70 85 88 97 98 100 103 104 112 121 122 124 127 |
| 30-23.241 | 7 11 25 31 37 38 41 47 51 61 62 76 82 87 93 98 103 104 112 118 121 122 124 |
| 30-23.245a | 7 11 13 14 21 26 31 35 41 52 56 59 61 69 79 86 97 103 104 112 121 122 124 |
| 30-23.245c | 7 14 19 22 31 35 38 41 42 44 50 59 62 70 77 87 98 104 112 117 121 122 124 |
| 30-23.255 | 7 11 13 14 21 26 28 31 35 37 41 52 59 69 79 86 97 103 104 112 121 122 124 |
| 30-23.866 | 7 11 19 30 35 41 42 44 47 56 59 67 81 87 88 91 104 112 117 121 122 124 127 |
| 30-23.867 | 7 11 19 30 35 41 42 44 47 56 59 67 81 87 88 104 112 115 117 121 122 124 127 |
| 30-23.880 | 7 11 19 30 35 41 42 44 47 56 59 69 81 82 87 88 104 112 115 121 122 124 127 |
| 30-23.899 | 7 11 19 30 35 37 41 42 44 47 56 67 81 82 87 88 104 112 115 121 122 124 127 |
| 30-23.911 | 7 11 19 30 35 41 42 44 47 56 69 81 82 84 87 88 104 112 115 121 122 124 127 |
| 30-23.975 | 7 19 21 22 35 37 38 49 50 52 55 67 69 70 81 82 84 87 97 98 100 111 112 |
| 30-23.976 | 7 19 21 22 35 37 38 49 50 52 55 67 69 70 81 82 84 87 97 98 111 112 115 |

k = 31, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31-24.1 | 391 1134 5826 | 1 | 0 | 0 | 0 | 24 | 48 | 8 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | | 118 | 0 | 12 | 323 | 331 | 96 | 5.3525 | 1 |
| 31-24.2 | 391 1134 5827 | 2 | 0 | 0 | 0 | 24 | 48 | 8 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | | 118 | 0 | 12 | 324 | 332 | 97 | 5.3525 | 2 |
| 31-24.3 | 392 1132 5817 | 3 | 0 | 0 | 0 | 26 | 44 | 10 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 0 | | 118 | 0 | 13 | 325 | 333 | 174 | 5.3531 | 3 |
| 31-24.4 | 392 1134 5815 | 4 | 0 | 0 | 0 | 26 | 44 | 10 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 0 | | 118 | 0 | 13 | 326 | 334 | 175 | 5.3532 | 5 |
| 31-24.5 | 392 1136 5817 | 5 | 0 | 0 | 0 | 26 | 44 | 10 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 0 | | 118 | 0 | 13 | 327 | 335 | 176 | 5.3533 | 6 |
| 31-24.6 | 393 1132 5804 | 6 | 0 | 0 | 0 | 28 | 40 | 12 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | | 118 | 0 | 13 | 328 | 336 | 177 | 5.3537 | 8 |
| 31-24.7 | 393 1136 5804 | 7 | 0 | 0 | 0 | 28 | 40 | 12 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | | 118 | 0 | 13 | 329 | 337 | 178 | 5.3540 | 9 |
| 31-24.8 | 394 1132 5793 | 8 | 0 | 0 | 0 | 30 | 36 | 14 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 1 | 0 | | 118 | 0 | 14 | 330 | 338 | 275 | 5.3543 | 10 |
| 31-24.9 | 394 1136 5793 | 9 | 0 | 0 | 0 | 30 | 36 | 14 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 1 | 0 | | 118 | 0 | 14 | 331 | 339 | 276 | 5.3546 | 11 |
| 31-24.10 | 397 1128 5760 | 10 | 0 | 0 | 0 | 36 | 24 | 20 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 1 | | 118 | 0 | 15 | 332 | 340 | 399 | 5.3560 | 14 |
| 31-24.11 | 397 1136 5760 | 11 | 0 | 0 | 0 | 36 | 24 | 20 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 1 | | 118 | 0 | 15 | 333 | 341 | 400 | 5.3566 | 19 |
| 31-24.12 | 398 1102 5906 | 12 | 0 | 0 | 4 | 26 | 34 | 15 | 1 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | | 118 | 0 | 12 | 334 | 342 | 98 | 5.3557 | 12 |
| 31-24.13 | 398 1103 5906 | 13 | 0 | 0 | 4 | 26 | 34 | 15 | 1 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | | 118 | 0 | 12 | 335 | 343 | 99 | 5.3557 | 13 |
| 31-24.14a | 399 1102 5894 | 14 | 0 | 0 | 6 | 22 | 36 | 15 | 1 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | | 118 | 0 | 13 | 336 | 344 | 179 | 5.3563 | 15 |
| 31-24.14b | 399 1102 5894 | 14 | 0 | 0 | 4 | 28 | 30 | 17 | 1 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | | 118 | 0 | 13 | 336 | 344 | 179 | 5.3563 | 15 |
| 31-24.16 | 399 1103 5894 | 16 | 0 | 0 | 6 | 22 | 36 | 15 | 1 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | | 118 | 0 | 13 | 338 | 346 | 181 | 5.3564 | 17 |
| 31-24.17 | 399 1104 5894 | 17 | 0 | 0 | 4 | 28 | 30 | 17 | 1 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | | 118 | 0 | 13 | 339 | 347 | 182 | 5.3564 | 18 |

k = 31, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31-24.43 | 410 1060 6148 | 43 | 0 | 30 | 0 | 0 | 51 | 0 | 0 | 5 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | | 127 | 0 | 11 | 1 | 371 | 28 | 5.3625 | 47 |
| 31-24.104 | 439 914 6688 | 104 | 12 | 9 | 24 | 3 | 0 | 33 | 0 | 3 | 0 | 9 | 0 | 0 | 3 | 0 | 0 | | 127 | 12 | 13 | 2 | 237 | 220 | 5.3756 | 163 |
| 31-24.86 | 434 952 6549 | 86 | 8 | 6 | 16 | 33 | 0 | 0 | 9 | 15 | 0 | 1 | 0 | 6 | 0 | 0 | 0 | | 125 | 8 | 12 | 3 | 250 | 102 | 5.3742 | 149 |
| 31-24.99 | 437 940 6576 | 99 | 8 | 6 | 16 | 33 | 0 | 0 | 16 | 2 | 6 | 0 | 1 | 6 | 0 | 0 | 0 | | 125 | 8 | 12 | 4 | 251 | 103 | 5.3757 | 164 |
| 31-24.105 | 439 938 6552 | 105 | 8 | 10 | 8 | 37 | 0 | 0 | 16 | 2 | 6 | 1 | 0 | 5 | 1 | 0 | 0 | | 125 | 8 | 13 | 5 | 252 | 221 | 5.3768 | 183 |
| 31-24.119 | 445 892 6772 | 119 | 11 | 6 | 22 | 10 | 14 | 0 | 9 | 15 | 0 | 0 | 4 | 0 | 3 | 0 | 0 | | 125 | 11 | 13 | 6 | 243 | 225 | 5.3789 | 206 |
| 31-24.125 | 449 880 6788 | 125 | 11 | 6 | 24 | 6 | 16 | 0 | 16 | 2 | 6 | 0 | 3 | 1 | 3 | 0 | 0 | | 125 | 11 | 13 | 7 | 244 | 227 | 5.3810 | 229 |
| 31-24.130 | 451 878 6768 | 130 | 13 | 2 | 28 | 2 | 18 | 0 | 16 | 2 | 6 | 0 | 4 | 0 | 2 | 1 | 0 | | 125 | 13 | 14 | 8 | 236 | 324 | 5.3821 | 241 |
| 31-24.37 | 408 848 7637 | 37 | 6 | 26 | 0 | 0 | 3 | 27 | 24 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | | 124 | 6 | 14 | 9 | 264 | 283 | 5.3531 | 4 |

k = 31, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31-24.433 | 819 | 126 | 14560 | 433 | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 3 | 0 | 121 | 59 | 14 | 313 | 1 | 398 | 5.6579 | 433 |
| 31-24.390 | 525 | 420 | 8876 | 390 | 37 | 0 | 0 | 0 | 0 | 14 | 19 | 15 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 123 | 37 | 13 | 234 | 2 | 267 | 5.4124 | 376 |
| 31-24.397 | 531 | 414 | 8896 | 397 | 37 | 0 | 0 | 0 | 6 | 2 | 32 | 2 | 6 | 0 | 0 | 0 | 6 | 1 | 0 | 123 | 37 | 14 | 236 | 3 | 381 | 5.4165 | 387 |
| 31-24.401 | 539 | 406 | 8960 | 401 | 36 | 0 | 0 | 0 | 6 | 18 | 0 | 17 | 7 | 0 | 0 | 0 | 6 | 1 | 0 | 122 | 36 | 14 | 304 | 4 | 382 | 5.4223 | 396 |
| 31-24.412 | 563 | 382 | 9184 | 412 | 35 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 4 | 3 | 0 | 121 | 35 | 14 | 312 | 5 | 386 | 5.4401 | 412 |
| 31-24.429 | 643 | 302 | 10672 | 429 | 35 | 2 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 2 | 4 | 1 | 0 | 123 | 35 | 14 | 252 | 6 | 395 | 5.5057 | 429 |
| 31-24.422 | 591 | 354 | 9744 | 422 | 34 | 2 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 1 | 5 | 1 | 0 | 122 | 34 | 14 | 308 | 7 | 391 | 5.4633 | 422 |
| 31-24.431 | 719 | 226 | 12176 | 431 | 34 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 5 | 1 | 0 | 122 | 34 | 14 | 310 | 8 | 397 | 5.5695 | 431 |

k = 31, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | | | wlp rank | alp | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31-24.128a | 451 | 494 | 9208 | 128 | 30 | 0 | 0 | 0 | 6 | 19 | 12 | 18 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 30 | 9 | 45 | 44 | 1 | 5.3661 | 65 |
| 31-24.135 | 453 | 492 | 9188 | 135 | 30 | 0 | 0 | 0 | 9 | 14 | 15 | 15 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 123 | 30 | 9 | 49 | 48 | 2 | 5.3673 | 75 |
| 31-24.121 | 447 | 498 | 9240 | 121 | 30 | 0 | 0 | 2 | 1 | 8 | 40 | 8 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 123 | 30 | 10 | 43 | 42 | 3 | 5.3637 | 56 |
| 31-24.123 | 449 | 496 | 9224 | 123 | 30 | 0 | 0 | 1 | 4 | 13 | 25 | 14 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 123 | 30 | 10 | 44 | 43 | 4 | 5.3649 | 59 |
| 31-24.128b | 451 | 494 | 9208 | 128 | 30 | 0 | 0 | 3 | 0 | 16 | 24 | 15 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 123 | 30 | 10 | 45 | 44 | 5 | 5.3661 | 66 |
| 31-24.142 | 455 | 490 | 9160 | 142 | 30 | 0 | 0 | 0 | 11 | 10 | 20 | 10 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 123 | 30 | 10 | 51 | 50 | 6 | 5.3684 | 79 |
| 31-24.144 | 455 | 490 | 9172 | 144 | 30 | 0 | 0 | 2 | 5 | 17 | 14 | 16 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 123 | 30 | 10 | 53 | 52 | 7 | 5.3685 | 82 |
| 31-24.145 | 455 | 490 | 9184 | 145 | 30 | 0 | 0 | 0 | 11 | 10 | 20 | 10 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 123 | 30 | 10 | 54 | 53 | 8 | 5.3686 | 83 |

k = 31, Design generators

| Design | Design Generators |
|---|---|
| 31-24.1 | 7 11 19 21 22 25 26 35 45 46 49 60 67 77 78 81 95 101 105 108 116 120 123 126 |
| 31-24.2 | 7 11 19 29 30 35 41 44 47 53 54 56 67 77 78 81 84 88 104 112 121 122 124 127 |
| 31-24.3 | 7 11 19 29 30 35 45 46 53 57 58 60 67 86 92 97 98 100 103 104 107 112 115 125 |
| 31-24.4 | 7 11 19 29 30 35 41 47 53 54 56 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 31-24.5 | 7 11 19 30 35 41 47 53 54 56 59 77 82 84 88 101 102 104 107 112 121 122 124 127 |
| 31-24.6 | 7 11 19 29 30 35 45 46 53 57 58 60 67 86 95 97 98 100 103 104 107 112 115 125 |
| 31-24.7 | 7 19 29 30 35 49 50 52 55 56 67 79 85 86 88 101 102 104 112 115 121 122 124 127 |
| 31-24.8 | 7 11 19 29 30 35 45 46 53 57 58 60 63 67 86 97 98 100 103 104 107 112 115 125 |
| 31-24.9 | 7 11 19 29 30 35 41 47 53 54 59 77 82 84 88 91 102 104 107 112 121 122 124 127 |
| 31-24.10 | 7 11 19 29 30 35 41 47 53 59 78 82 84 88 91 101 102 104 107 112 121 122 124 127 |
| 31-24.11 | 7 11 19 29 30 35 41 47 53 59 78 82 84 88 101 102 104 107 112 115 121 122 124 127 |
| 31-24.12 | 7 11 19 29 30 35 41 42 47 53 56 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 31-24.13 | 7 11 19 30 35 41 42 47 53 54 56 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 31-24.14a | 7 11 19 29 30 35 41 42 47 53 54 56 59 82 84 88 102 104 107 112 121 122 124 127 |
| 31-24.14b | 7 11 19 29 30 35 41 47 53 54 56 59 82 84 88 91 102 104 107 112 121 122 124 127 |
| 31-24.16 | 7 11 19 29 30 35 41 42 44 47 53 54 56 67 77 81 84 88 104 112 121 122 124 127 |
| 31-24.17 | 7 11 19 30 35 41 47 53 54 56 59 77 82 84 88 91 102 104 107 112 121 122 124 127 |
| 31-24.37 | 7 11 19 29 30 35 37 38 41 42 49 67 69 70 76 84 104 107 112 115 121 122 124 127 |
| 31-24.43 | 7 11 19 29 35 37 38 57 63 67 69 70 73 79 81 87 97 98 100 103 109 117 120 123 |
| 31-24.86 | 7 11 13 14 19 21 22 26 35 38 63 67 69 73 74 76 79 81 82 84 100 120 123 125 |
| 31-24.99 | 7 13 19 21 22 35 37 38 44 49 50 52 55 56 67 69 81 84 90 95 97 106 112 126 |
| 31-24.104 | 7 11 14 25 26 28 31 45 53 56 67 70 85 88 97 98 100 103 104 112 121 122 124 127 |
| 31-24.105 | 7 13 19 21 22 25 35 37 38 49 50 52 55 56 67 69 81 84 95 97 106 111 112 126 |
| 31-24.119 | 7 11 19 25 35 41 42 44 54 56 59 67 77 78 81 88 104 107 112 115 121 122 124 127 |
| 31-24.121 | 7 11 13 14 21 26 31 35 37 41 52 56 59 69 74 79 86 97 103 104 112 121 122 124 |
| 31-24.123 | 7 11 13 14 19 28 31 35 38 42 49 50 52 59 67 76 85 98 104 109 112 121 122 124 |
| 31-24.125 | 7 13 19 21 22 25 35 37 38 44 49 50 52 55 56 67 69 81 84 95 97 106 112 126 |
| 31-24.128a | 7 11 13 14 21 26 28 31 35 37 41 52 56 59 69 79 86 97 103 104 112 121 122 124 |
| 31-24.128b | 7 11 13 14 21 26 31 35 41 52 56 59 61 69 74 79 86 97 103 104 112 121 122 124 |
| 31-24.130 | 7 13 19 21 22 25 35 37 38 41 49 50 52 55 56 67 69 81 84 95 97 111 112 126 |
| 31-24.135 | 7 11 13 14 21 26 28 31 35 41 52 56 59 61 69 79 86 97 103 104 112 121 122 124 |
| 31-24.142 | 7 11 19 21 22 25 31 35 38 47 49 56 59 61 67 78 82 84 98 103 112 121 122 124 |
| 31-24.144 | 7 11 13 14 19 25 28 31 35 38 49 50 52 59 67 79 85 98 104 109 112 121 122 124 |
| 31-24.145 | 7 11 13 14 19 28 31 35 38 42 49 50 52 59 62 67 85 98 104 109 112 121 122 124 |
| 31-24.390 | 7 11 19 30 35 37 41 42 44 47 56 67 81 82 87 88 104 107 112 115 121 122 124 127 |
| 31-24.397 | 7 11 19 30 35 41 42 44 47 56 59 69 81 82 84 87 88 104 112 115 121 122 124 127 |
| 31-24.401 | 7 11 19 30 35 37 41 42 44 47 56 67 81 82 84 87 88 104 112 115 121 122 124 127 |
| 31-24.412 | 7 11 19 30 35 37 41 42 44 47 56 81 82 84 87 88 91 104 112 115 121 122 124 127 |
| 31-24.422 | 7 11 19 30 35 37 38 41 42 44 47 81 82 84 87 88 91 104 112 115 121 122 124 127 |
| 31-24.429 | 7 19 21 22 35 37 38 49 50 52 56 67 69 70 81 82 88 97 98 111 112 115 117 118 |
| 31-24.431 | 7 19 21 22 35 37 38 49 50 52 55 56 67 69 70 81 82 84 97 98 111 112 115 118 |
| 31-24.433 | 7 19 21 22 35 37 38 49 50 52 55 67 69 70 81 82 84 87 97 98 100 111 112 115 |

k = 32, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32-25.1 | 452 1322 7219 | 1 | 0 | 0 | 0 | 12 | 48 | 19 | 1 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 119 | 0 | 13 | 130 | 125 | 46 | 4.8919 | 2 |
| 32-25.2 | 452 1323 7218 | 2 | 0 | 0 | 0 | 12 | 48 | 19 | 1 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 119 | 0 | 13 | 131 | 126 | 47 | 4.8920 | 3 |
| 32-25.3 | 452 1324 7219 | 3 | 0 | 0 | 0 | 12 | 48 | 19 | 1 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 0 | 119 | 0 | 13 | 132 | 127 | 48 | 4.8921 | 4 |
| 32-25.4 | 453 1322 7206 | 4 | 0 | 0 | 0 | 14 | 44 | 21 | 1 | 0 | 0 | 0 | 0 | 5 | 1 | 1 | 0 | 0 | 119 | 0 | 14 | 133 | 128 | 75 | 4.8925 | 5 |
| 32-25.5 | 453 1324 7206 | 5 | 0 | 0 | 0 | 14 | 44 | 21 | 1 | 0 | 0 | 0 | 0 | 5 | 1 | 1 | 0 | 0 | 119 | 0 | 14 | 134 | 129 | 76 | 4.8926 | 6 |
| 32-25.6 | 455 1320 7182 | 6 | 0 | 0 | 0 | 18 | 36 | 25 | 1 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 119 | 0 | 15 | 135 | 130 | 127 | 4.8935 | 7 |
| 32-25.7 | 455 1324 7182 | 7 | 0 | 0 | 0 | 18 | 36 | 25 | 1 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 119 | 0 | 15 | 136 | 131 | 128 | 4.8938 | 8 |
| 32-25.8 | 458 1296 7272 | 8 | 0 | 0 | 0 | 24 | 24 | 32 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 119 | 0 | 13 | 137 | 132 | 49 | 4.8944 | 9 |
| 32-25.9 | 458 1296 7273 | 9 | 0 | 0 | 0 | 24 | 24 | 32 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 119 | 0 | 13 | 138 | 133 | 50 | 4.8944 | 10 |
| 32-25.10 | 459 1296 7260 | 10 | 0 | 0 | 0 | 26 | 20 | 34 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 0 | 119 | 0 | 14 | 139 | 134 | 77 | 4.8949 | 11 |
| 32-25.11 | 459 1296 7262 | 11 | 0 | 0 | 0 | 26 | 20 | 34 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 0 | 119 | 0 | 14 | 140 | 135 | 78 | 4.8950 | 12 |
| 32-25.12 | 460 1286 7320 | 12 | 0 | 0 | 2 | 21 | 27 | 27 | 3 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 119 | 0 | 13 | 141 | 136 | 51 | 4.8952 | 13 |
| 32-25.13 | 460 1287 7320 | 13 | 0 | 0 | 2 | 21 | 27 | 27 | 3 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 119 | 0 | 13 | 142 | 137 | 52 | 4.8953 | 14 |
| 32-25.14 | 460 1296 7248 | 14 | 0 | 0 | 0 | 28 | 16 | 36 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | 119 | 0 | 14 | 143 | 138 | 79 | 4.8955 | 15 |
| 32-25.15 | 461 1285 7308 | 15 | 0 | 0 | 4 | 17 | 29 | 27 | 3 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 0 | 119 | 0 | 14 | 144 | 139 | 80 | 4.8957 | 16 |

k = 32, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32-25.66 | 509 1080 8232 | 66 | 8 | 6 | 8 | 41 | 0 | 0 | 0 | 17 | 7 | 0 | 1 | 0 | 6 | 0 | 0 | 0 | 126 | 8 | 13 | 1 | 92 | 57 | 4.9180 | 97 |
| 32-25.76 | 521 1012 8504 | 76 | 11 | 3 | 25 | 5 | 19 | 0 | 0 | 17 | 7 | 0 | 0 | 4 | 0 | 3 | 0 | 0 | 126 | 11 | 14 | 2 | 88 | 107 | 4.9225 | 115 |
| 32-25.25 | 471 976 9510 | 25 | 4 | 28 | 0 | 0 | 0 | 13 | 33 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 125 | 4 | 15 | 3 | 98 | 131 | 4.8919 | 1 |
| 32-25.42 | 489 940 9408 | 42 | 4 | 28 | 0 | 0 | 12 | 18 | 0 | 17 | 13 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 125 | 4 | 15 | 4 | 99 | 135 | 4.9007 | 27 |
| 32-25.57 | 501 916 9340 | 57 | 4 | 28 | 0 | 1 | 21 | 8 | 0 | 8 | 20 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 125 | 4 | 15 | 5 | 100 | 139 | 4.9065 | 44 |
| 32-25.60 | 503 912 9382 | 60 | 4 | 28 | 0 | 12 | 0 | 1 | 33 | 2 | 0 | 12 | 0 | 0 | 0 | 0 | 1 | 0 | 125 | 4 | 15 | 6 | 101 | 141 | 4.9078 | 52 |
| 32-25.61 | 505 908 9344 | 61 | 4 | 28 | 0 | 6 | 12 | 12 | 0 | 11 | 13 | 6 | 0 | 0 | 0 | 0 | 1 | 0 | 125 | 4 | 15 | 7 | 102 | 142 | 4.9086 | 56 |
| 32-25.64 | 507 904 9354 | 64 | 4 | 28 | 0 | 12 | 0 | 10 | 16 | 10 | 0 | 11 | 1 | 0 | 0 | 0 | 1 | 0 | 125 | 4 | 15 | 8 | 104 | 145 | 4.9097 | 62 |
| 32-25.71 | 517 568 11424 | 71 | 31 | 0 | 0 | 1 | 2 | 4 | 24 | 24 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 11 | 9 | 17 | 5 | 4.9035 | 34 |
| 32-25.73 | 519 880 9382 | 73 | 4 | 28 | 6 | 6 | 0 | 7 | 21 | 8 | 0 | 6 | 6 | 0 | 0 | 0 | 1 | 0 | 125 | 4 | 15 | 10 | 105 | 149 | 4.9162 | 88 |

k = 32, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,...) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32-25.197 | 945 140 18200 | 197 | 61 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 1 | 0 | 124 | 61 | 15 | 104 | 1 | 186 | 5.2139 | 197 |
| 32-25.178 | 609 476 11032 | 178 | 38 | 0 | 0 | 0 | 0 | 7 | 17 | 17 | 7 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 125 | 38 | 14 | 85 | 2 | 123 | 4.9554 | 172 |
| 32-25.180 | 625 460 11160 | 180 | 37 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 124 | 37 | 15 | 101 | 3 | 177 | 4.9659 | 177 |
| 32-25.184 | 633 452 11640 | 184 | 34 | 0 | 4 | 5 | 19 | 0 | 0 | 0 | 0 | 19 | 5 | 4 | 0 | 3 | 0 | 0 | 125 | 34 | 14 | 89 | 4 | 124 | 4.9742 | 185 |
| 32-25.189 | 681 404 12280 | 189 | 34 | 3 | 1 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 1 | 3 | 3 | 0 | 0 | 125 | 34 | 14 | 91 | 5 | 125 | 5.0077 | 189 |
| 32-25.194 | 745 340 13432 | 194 | 34 | 3 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 3 | 3 | 0 | 0 | 125 | 34 | 14 | 93 | 6 | 126 | 5.0549 | 194 |
| 32-25.186 | 641 444 11576 | 186 | 33 | 4 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 4 | 2 | 1 | 0 | 124 | 33 | 15 | 102 | 7 | 179 | 4.9785 | 186 |
| 32-25.196 | 833 252 15288 | 196 | 33 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 2 | 1 | 0 | 124 | 33 | 15 | 103 | 8 | 185 | 5.1225 | 196 |
| 32-25.89 | 529 556 11320 | 89 | 32 | 0 | 0 | 0 | 0 | 13 | 17 | 17 | 13 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 125 | 32 | 14 | 18 | 9 | 111 | 4.9099 | 64 |
| 32-25.123 | 545 540 11224 | 123 | 32 | 0 | 0 | 0 | 12 | 1 | 17 | 17 | 1 | 12 | 0 | 0 | 0 | 1 | 0 | 0 | 125 | 32 | 14 | 44 | 10 | 114 | 4.9187 | 101 |

k = 32, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,...) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32-25.75 | 521 564 11392 | 75 | 31 | 0 | 0 | 0 | 3 | 13 | 15 | 15 | 13 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 10 | 12 | 19 | 1 | 4.9056 | 41 |
| 32-25.79c | 525 560 11336 | 79 | 31 | 0 | 0 | 0 | 6 | 10 | 15 | 15 | 10 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 10 | 13 | 22 | 2 | 4.9076 | 47 |
| 32-25.82 | 525 560 11352 | 82 | 31 | 0 | 0 | 0 | 6 | 10 | 15 | 15 | 10 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 10 | 15 | 23 | 3 | 4.9077 | 50 |
| 32-25.93 | 529 556 11344 | 93 | 31 | 0 | 0 | 0 | 9 | 7 | 15 | 15 | 7 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 10 | 22 | 29 | 4 | 4.9101 | 68 |
| 32-25.71 | 517 568 11424 | 71 | 31 | 0 | 0 | 1 | 2 | 4 | 24 | 24 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 11 | 9 | 17 | 5 | 4.9035 | 34 |
| 32-25.83 | 525 560 11360 | 83 | 31 | 0 | 0 | 2 | 1 | 13 | 15 | 15 | 13 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 11 | 16 | 24 | 6 | 4.9078 | 51 |
| 32-25.91 | 529 556 11320 | 91 | 31 | 0 | 0 | 2 | 4 | 10 | 15 | 15 | 10 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 11 | 20 | 27 | 7 | 4.9099 | 63 |
| 32-25.92 | 529 556 11344 | 92 | 31 | 0 | 0 | 3 | 0 | 16 | 12 | 12 | 16 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 11 | 21 | 28 | 8 | 4.9100 | 67 |
| 32-25.96 | 533 552 11288 | 96 | 31 | 0 | 0 | 3 | 3 | 13 | 12 | 12 | 13 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 11 | 24 | 30 | 9 | 4.9120 | 71 |
| 32-25.98 | 533 552 11312 | 98 | 31 | 0 | 0 | 2 | 7 | 7 | 15 | 15 | 7 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 125 | 31 | 11 | 26 | 32 | 10 | 4.9122 | 73 |

k = 32, Design generators

| Design | Design Generators |
|---|---|
| 32-25.1 | 7 11 19 29 30 35 45 46 53 54 57 60 67 86 89 95 97 98 100 103 104 107 112 115 125 |
| 32-25.2 | 7 11 19 29 30 35 41 42 47 53 54 56 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 32-25.3 | 7 11 19 30 35 41 42 47 53 54 56 59 77 82 84 88 101 102 104 107 112 121 122 124 127 |
| 32-25.4 | 7 11 19 29 30 35 45 46 53 54 57 58 60 67 86 92 97 98 100 103 104 107 112 115 125 |
| 32-25.5 | 7 11 19 29 30 35 41 47 53 54 56 59 77 82 84 88 91 102 104 107 112 121 122 124 127 |
| 32-25.6 | 7 11 19 29 30 35 45 46 53 54 57 58 67 86 92 95 97 98 100 103 104 107 112 115 125 |
| 32-25.7 | 7 11 19 29 30 35 45 46 53 54 57 58 60 63 67 86 97 98 100 103 104 107 112 115 125 |
| 32-25.8 | 7 11 13 14 19 21 22 25 26 35 41 42 52 61 67 73 84 87 93 101 102 108 114 120 123 |
| 32-25.9 | 7 11 13 14 19 21 22 25 26 35 41 42 52 61 67 73 84 87 93 101 102 108 111 114 120 |
| 32-25.10 | 7 11 13 14 19 21 22 25 26 35 41 42 52 61 67 73 74 84 93 101 102 108 113 114 120 |
| 32-25.11 | 7 11 13 14 19 21 22 25 26 35 41 42 52 61 67 73 74 84 93 101 102 108 111 114 120 |
| 32-25.12 | 7 11 19 29 30 35 41 42 44 47 53 56 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 32-25.13 | 7 11 19 30 35 41 42 44 47 53 54 56 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 32-25.14 | 7 14 22 25 26 28 38 43 45 51 53 56 70 77 85 88 97 98 100 103 104 112 121 122 124 |
| 32-25.15 | 7 11 19 29 30 35 45 46 53 54 57 58 67 77 86 92 97 98 100 103 104 107 112 115 125 |
| 32-25.25 | 7 11 19 29 30 35 37 38 41 42 49 50 67 69 70 76 84 104 107 112 115 121 122 124 127 |
| 32-25.42 | 7 11 19 29 38 41 42 47 49 56 62 70 73 82 87 88 101 104 107 112 115 121 122 124 127 |
| 32-25.57 | 7 11 19 29 30 35 37 38 41 42 44 47 67 73 74 76 88 104 107 112 115 121 122 124 127 |
| 32-25.60 | 7 11 19 25 26 28 31 35 37 38 41 42 44 67 69 70 73 74 76 109 110 117 118 120 123 |
| 32-25.61 | 7 11 19 29 30 35 37 38 41 42 44 47 67 73 76 88 91 104 107 112 115 121 122 124 127 |
| 32-25.64 | 7 11 19 25 31 35 46 50 52 56 59 74 76 86 88 97 103 104 107 112 115 121 122 124 127 |
| 32-25.66 | 7 13 19 21 22 25 35 37 38 49 50 52 55 56 67 69 81 84 95 97 100 106 111 112 126 |
| 32-25.71 | 7 11 13 14 19 28 31 35 38 42 49 50 52 59 67 76 79 85 98 104 109 112 121 122 124 |
| 32-25.73 | 7 11 19 25 31 35 46 50 52 56 59 67 74 86 88 97 103 104 107 112 115 121 122 124 127 |
| 32-25.75 | 7 11 13 14 19 25 28 31 35 38 42 49 50 52 59 67 79 85 98 104 109 112 121 122 124 |
| 32-25.76 | 7 13 19 21 22 25 35 37 38 41 49 50 52 55 56 67 69 81 84 95 97 100 111 112 126 |
| 32-25.79c | 7 11 19 21 22 25 31 35 38 47 49 56 59 61 67 78 82 84 98 100 103 112 121 122 124 |
| 32-25.82 | 7 11 13 14 19 25 28 31 35 38 49 50 52 59 62 67 79 85 98 104 109 112 121 122 124 |
| 32-25.83 | 7 11 13 14 19 25 28 31 35 38 42 49 50 52 59 67 79 85 98 104 107 112 121 122 124 |
| 32-25.91 | 7 19 22 29 35 37 38 41 42 44 50 67 69 76 82 84 91 104 107 112 115 121 122 124 127 |
| 32-25.92 | 7 11 13 14 19 25 28 31 35 38 42 49 50 52 59 67 85 98 104 107 109 112 121 122 124 |
| 32-25.93 | 7 11 13 14 19 25 28 31 35 38 42 49 50 52 59 62 67 79 85 98 104 112 121 122 124 |
| 32-25.96 | 7 19 22 29 35 37 38 41 42 44 50 67 69 73 76 82 91 104 107 112 115 121 122 124 127 |
| 32-25.98 | 7 11 19 30 35 38 41 42 44 47 67 69 74 76 81 87 88 104 109 112 117 121 122 124 127 |
| 32-25.178 | 7 11 19 30 35 37 41 42 44 47 56 67 81 82 84 87 88 104 107 112 115 121 122 124 127 |
| 32-25.180 | 7 11 19 30 35 37 41 42 44 47 56 67 81 82 84 87 88 91 104 112 115 121 122 124 127 |
| 32-25.184 | 7 11 19 30 35 37 41 42 44 47 56 81 82 84 87 88 93 104 112 115 117 121 122 124 127 |
| 32-25.186 | 7 11 19 30 35 37 41 42 44 47 56 81 82 84 87 88 91 93 104 112 115 121 122 124 127 |
| 32-25.189 | 7 11 19 30 35 37 38 41 42 44 47 81 82 84 87 88 91 93 104 112 115 121 122 124 127 |
| 32-25.194 | 7 19 21 22 35 37 38 49 50 52 56 67 69 70 81 82 84 88 97 98 100 111 112 115 118 |
| 32-25.196 | 7 19 21 22 35 37 38 49 50 52 55 56 67 69 70 81 82 84 97 98 100 111 112 115 118 |
| 32-25.197 | 7 19 21 22 35 37 38 49 50 52 55 67 69 70 81 82 84 87 97 98 100 111 112 115 117 |

k = 33, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33-26.1 | 518 1543 8863 | 1 | 0 | 0 | 0 | 4 | 40 | 33 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 120 | 0 | 14 | 67 | 67 | 27 | 4.4789 | 2 |
| 33-26.2 | 518 1544 8863 | 2 | 0 | 0 | 0 | 4 | 40 | 33 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 120 | 0 | 14 | 68 | 68 | 28 | 4.4790 | 3 |
| 33-26.3 | 519 1542 8850 | 3 | 0 | 0 | 0 | 6 | 36 | 35 | 3 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 120 | 0 | 15 | 69 | 69 | 46 | 4.4794 | 4 |
| 33-26.4 | 519 1544 8850 | 4 | 0 | 0 | 0 | 6 | 36 | 35 | 3 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 120 | 0 | 15 | 70 | 70 | 47 | 4.4795 | 5 |
| 33-26.5 | 525 1512 8935 | 5 | 0 | 0 | 0 | 12 | 30 | 30 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 120 | 0 | 14 | 71 | 71 | 29 | 4.4815 | 6 |
| 33-26.6 | 525 1512 8936 | 6 | 0 | 0 | 0 | 12 | 30 | 30 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 120 | 0 | 14 | 72 | 72 | 30 | 4.4815 | 7 |
| 33-26.7 | 526 1512 8922 | 7 | 0 | 0 | 0 | 14 | 26 | 32 | 8 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 1 | 0 | 120 | 0 | 15 | 73 | 73 | 48 | 4.4820 | 8 |
| 33-26.8 | 527 1500 8992 | 8 | 0 | 0 | 0 | 20 | 12 | 42 | 6 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 120 | 0 | 14 | 74 | 74 | 31 | 4.4822 | 9 |
| 33-26.9 | 527 1501 8992 | 9 | 0 | 0 | 0 | 20 | 12 | 42 | 6 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 120 | 0 | 14 | 75 | 75 | 32 | 4.4822 | 10 |
| 33-26.10 | 527 1501 8992 | 10 | 0 | 0 | 0 | 20 | 12 | 42 | 6 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 120 | 0 | 14 | 76 | 76 | 33 | 4.4822 | 11 |
| 33-26.11 | 528 1512 8896 | 11 | 0 | 0 | 0 | 18 | 18 | 36 | 8 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 1 | 120 | 0 | 16 | 77 | 77 | 74 | 4.4830 | 12 |
| 33-26.12 | 534 1470 9067 | 12 | 0 | 0 | 2 | 16 | 26 | 19 | 17 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 120 | 0 | 14 | 78 | 78 | 34 | 4.4848 | 13 |
| 33-26.13 | 535 1470 9054 | 13 | 0 | 0 | 4 | 12 | 28 | 19 | 17 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 120 | 0 | 15 | 79 | 79 | 49 | 4.4853 | 14 |
| 33-26.14 | 540 1120 11756 | 14 | 2 | 30 | 0 | 0 | 0 | 0 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 126 | 2 | 16 | 43 | 55 | 75 | 4.4784 | 1 |
| 33-26.15 | 541 1440 9144 | 15 | 0 | 0 | 4 | 16 | 20 | 32 | 0 | 8 | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 120 | 0 | 14 | 80 | 80 | 35 | 4.4875 | 16 |
| 33-26.16a | 542 1440 9130 | 16 | 0 | 0 | 4 | 18 | 16 | 34 | 0 | 8 | 0 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 120 | 0 | 15 | 81 | 81 | 50 | 4.4880 | 17 |
| 33-26.16b | 542 1440 9130 | 16 | 0 | 0 | 6 | 12 | 22 | 32 | 0 | 8 | 0 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 120 | 0 | 15 | 81 | 81 | 50 | 4.4880 | 17 |
| 33-26.18 | 543 1440 9118 | 18 | 0 | 0 | 8 | 8 | 24 | 32 | 0 | 8 | 0 | 0 | 0 | 0 | 4 | 1 | 2 | 0 | 120 | 0 | 15 | 83 | 83 | 52 | 4.4885 | 19 |
| 33-26.19 | 544 1440 9104 | 19 | 0 | 0 | 8 | 10 | 20 | 34 | 0 | 8 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 1 | 120 | 0 | 16 | 84 | 84 | 76 | 4.4890 | 20 |
| 33-26.20 | 551 1400 9270 | 20 | 0 | 1 | 5 | 12 | 38 | 0 | 16 | 8 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 120 | 0 | 15 | 85 | 85 | 53 | 4.4915 | 22 |

k = 33, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33-26.38 | 592 648 14048 | 38 | 32 | 0 | 0 | 1 | 0 | 6 | 0 | 48 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 1 | 8 | 7 | 4.4900 | 21 |
| 33-26.39 | 592 1224 10272 | 39 | 8 | 6 | 0 | 49 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 1 | 0 | 6 | 0 | 0 | 127 | 8 | 14 | 2 | 49 | 38 | 4.5096 | 61 |
| 33-26.41 | 597 643 14008 | 41 | 32 | 0 | 0 | 0 | 3 | 0 | 28 | 0 | 28 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 11 | 3 | 9 | 3 | 4.4924 | 24 |
| 33-26.42c | 600 640 13952 | 42 | 32 | 0 | 0 | 0 | 0 | 16 | 0 | 30 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 10 | 4 | 11 | 1 | 4.4937 | 27 |
| 33-26.42b | 600 640 13952 | 42 | 32 | 0 | 0 | 4 | 0 | 0 | 0 | 54 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 4 | 11 | 8 | 4.4937 | 28 |
| 33-26.45 | 600 640 13984 | 45 | 32 | 0 | 0 | 0 | 0 | 16 | 0 | 30 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 10 | 6 | 13 | 2 | 4.4939 | 30 |
| 33-26.50 | 605 635 13928 | 50 | 33 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 127 | 33 | 15 | 7 | 5 | 64 | 4.4962 | 35 |
| 33-26.51b | 605 635 13928 | 50 | 32 | 0 | 1 | 0 | 3 | 0 | 27 | 0 | 27 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 127 | 32 | 13 | 8 | 14 | 19 | 4.4962 | 35 |
| 33-26.51a | 605 635 13928 | 50 | 32 | 0 | 0 | 0 | 6 | 0 | 25 | 0 | 25 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 11 | 8 | 14 | 4 | 4.4962 | 35 |
| 33-26.53 | 605 1147 10600 | 53 | 11 | 0 | 28 | 0 | 24 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 4 | 0 | 3 | 0 | 127 | 11 | 15 | 10 | 48 | 65 | 4.5138 | 69 |
| 33-26.54b | 608 632 13920 | 54 | 32 | 1 | 0 | 0 | 0 | 13 | 0 | 34 | 0 | 13 | 0 | 0 | 0 | 1 | 0 | 0 | 127 | 32 | 14 | 11 | 16 | 39 | 4.4978 | 39 |
| 33-26.54a | 608 632 13920 | 54 | 32 | 0 | 0 | 2 | 0 | 14 | 0 | 30 | 0 | 14 | 0 | 2 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 11 | 16 | 9 | 4.4978 | 39 |
| 33-26.56b | 613 627 13912 | 56 | 32 | 0 | 0 | 0 | 9 | 0 | 22 | 0 | 22 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 11 | 13 | 18 | 5 | 4.5004 | 42 |
| 33-26.56a | 613 627 13912 | 56 | 32 | 0 | 1 | 0 | 6 | 0 | 24 | 0 | 24 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 127 | 32 | 13 | 13 | 18 | 20 | 4.5004 | 42 |
| 33-26.58 | 616 624 13856 | 58 | 32 | 0 | 0 | 3 | 0 | 16 | 0 | 24 | 0 | 16 | 0 | 3 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 15 | 20 | 10 | 4.5016 | 44 |
| 33-26.59b | 616 624 13888 | 59 | 32 | 0 | 0 | 3 | 0 | 16 | 0 | 24 | 0 | 16 | 0 | 3 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 16 | 21 | 11 | 4.5018 | 45 |
| 33-26.59a | 616 624 13888 | 59 | 32 | 0 | 0 | 7 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 16 | 21 | 11 | 4.5018 | 45 |
| 33-26.61 | 621 619 13832 | 61 | 32 | 0 | 1 | 0 | 9 | 0 | 21 | 0 | 21 | 0 | 9 | 0 | 1 | 0 | 0 | 0 | 127 | 32 | 13 | 18 | 23 | 21 | 4.5042 | 50 |
| 33-26.62 | 624 616 13792 | 62 | 32 | 1 | 0 | 1 | 0 | 21 | 0 | 16 | 0 | 21 | 0 | 1 | 0 | 1 | 0 | 0 | 127 | 32 | 14 | 19 | 24 | 40 | 4.5055 | 52 |
| 33-26.63 | 624 616 13792 | 63 | 32 | 0 | 0 | 7 | 0 | 6 | 0 | 36 | 0 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 20 | 25 | 13 | 4.5055 | 52 |
| 33-26.64 | 624 616 13920 | 64 | 32 | 0 | 0 | 3 | 0 | 22 | 0 | 12 | 0 | 22 | 0 | 3 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 21 | 26 | 14 | 4.5063 | 55 |
| 33-26.66 | 629 611 13816 | 66 | 32 | 0 | 2 | 0 | 9 | 0 | 20 | 0 | 20 | 0 | 9 | 0 | 2 | 0 | 0 | 0 | 127 | 32 | 13 | 22 | 27 | 22 | 4.5083 | 59 |
| 33-26.68 | 632 608 13824 | 68 | 32 | 0 | 0 | 6 | 0 | 16 | 0 | 18 | 0 | 16 | 0 | 6 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 23 | 28 | 15 | 4.5100 | 62 |
| 33-26.69 | 632 608 13856 | 69 | 32 | 0 | 0 | 6 | 0 | 16 | 0 | 18 | 0 | 16 | 0 | 6 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 24 | 29 | 16 | 4.5102 | 63 |
| 33-26.71 | 637 603 13736 | 71 | 33 | 0 | 0 | 0 | 12 | 0 | 18 | 0 | 18 | 0 | 12 | 0 | 0 | 0 | 1 | 0 | 127 | 33 | 15 | 25 | 6 | 67 | 4.5121 | 66 |
| 33-26.73 | 640 600 13792 | 73 | 32 | 1 | 0 | 6 | 0 | 13 | 0 | 22 | 0 | 13 | 0 | 6 | 0 | 1 | 0 | 0 | 127 | 32 | 14 | 26 | 31 | 41 | 4.5141 | 70 |
| 33-26.75 | 645 595 13720 | 75 | 32 | 0 | 7 | 0 | 0 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 127 | 32 | 13 | 27 | 32 | 23 | 4.5163 | 71 |
| 33-26.76 | 645 595 13976 | 76 | 32 | 0 | 0 | 0 | 21 | 0 | 10 | 0 | 10 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 11 | 28 | 33 | 6 | 4.5179 | 72 |
| 33-26.78 | 653 587 13896 | 78 | 32 | 0 | 3 | 0 | 15 | 0 | 13 | 0 | 13 | 0 | 15 | 0 | 3 | 0 | 0 | 0 | 127 | 32 | 13 | 29 | 34 | 24 | 4.5217 | 74 |
| 33-26.79 | 656 584 13792 | 79 | 32 | 2 | 0 | 9 | 0 | 4 | 0 | 32 | 0 | 4 | 0 | 9 | 0 | 2 | 0 | 0 | 127 | 32 | 14 | 30 | 35 | 42 | 4.5226 | 75 |
| 33-26.81 | 661 579 13880 | 81 | 32 | 0 | 6 | 0 | 9 | 0 | 16 | 0 | 16 | 0 | 9 | 0 | 6 | 0 | 0 | 0 | 127 | 32 | 13 | 31 | 36 | 25 | 4.5259 | 77 |
| 33-26.83 | 669 571 13800 | 83 | 33 | 0 | 6 | 0 | 6 | 0 | 18 | 0 | 18 | 0 | 6 | 0 | 6 | 0 | 1 | 0 | 127 | 33 | 15 | 32 | 7 | 68 | 4.5296 | 81 |
| 33-26.84 | 672 568 13664 | 84 | 32 | 7 | 0 | 0 | 0 | 7 | 0 | 34 | 0 | 7 | 0 | 0 | 0 | 7 | 0 | 0 | 127 | 32 | 14 | 33 | 38 | 43 | 4.5304 | 83 |
| 33-26.85 | 680 560 14112 | 85 | 32 | 0 | 0 | 15 | 0 | 16 | 0 | 0 | 0 | 16 | 0 | 15 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 34 | 39 | 17 | 4.5376 | 85 |
| 33-26.86 | 680 560 14144 | 86 | 32 | 0 | 0 | 15 | 0 | 16 | 0 | 0 | 0 | 16 | 0 | 15 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 35 | 40 | 18 | 4.5377 | 86 |
| 33-26.88 | 688 552 14048 | 88 | 32 | 3 | 0 | 9 | 0 | 19 | 0 | 0 | 0 | 19 | 0 | 9 | 0 | 3 | 0 | 0 | 127 | 32 | 14 | 36 | 41 | 44 | 4.5414 | 87 |
| 33-26.90 | 701 539 13608 | 90 | 39 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 127 | 39 | 15 | 37 | 2 | 70 | 4.5456 | 88 |
| 33-26.92 | 725 515 14520 | 92 | 32 | 0 | 10 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 10 | 0 | 0 | 0 | 127 | 32 | 13 | 38 | 43 | 26 | 4.5644 | 93 |
| 33-26.94 | 733 507 14440 | 94 | 35 | 0 | 4 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 4 | 0 | 3 | 0 | 127 | 35 | 15 | 39 | 3 | 71 | 4.5682 | 94 |
| 33-26.96 | 784 456 15328 | 96 | 32 | 6 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 6 | 0 | 0 | 127 | 32 | 14 | 40 | 45 | 45 | 4.6017 | 96 |
| 33-26.99 | 861 379 16744 | 99 | 35 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 3 | 0 | 127 | 35 | 15 | 41 | 4 | 72 | 4.6532 | 99 |

k = 33, Designs sorted based on degrees of freedom used (Continued)

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33-26.101 | 1085 155 22568 | 101 | 63 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 127 | 63 | 15 | 42 | 1 | 73 | 4.8177 | 101 |
| 33-26.14 | 540 1120 11756 | 14 | 2 | 30 | 0 | 0 | 0 | 0 | 30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 126 | 2 | 16 | 43 | 55 | 75 | 4.4784 | 1 |
| 33-26.24 | 560 1080 11632 | 24 | 2 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 126 | 2 | 16 | 44 | 56 | 77 | 4.4871 | 15 |
| 33-26.29 | 576 1048 11552 | 29 | 2 | 30 | 0 | 0 | 12 | 18 | 0 | 0 | 18 | 12 | 0 | 0 | 0 | 0 | 0 | 1 | 126 | 2 | 16 | 45 | 57 | 79 | 4.4942 | 31 |

k = 33, Designs sorted based on the number of clear two-factor interactions

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33-26.101 | 1085 155 22568 | 101 | 63 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 127 | 63 | 15 | 42 | 1 | 73 | 4.8177 | 101 |
| 33-26.90 | 701 539 13608 | 90 | 39 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 127 | 39 | 15 | 37 | 2 | 70 | 4.5456 | 88 |
| 33-26.94 | 733 507 14440 | 94 | 35 | 0 | 4 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 4 | 0 | 3 | 0 | 127 | 35 | 15 | 39 | 3 | 71 | 4.5682 | 94 |
| 33-26.99 | 861 379 16744 | 99 | 35 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 3 | 0 | 127 | 35 | 15 | 41 | 4 | 72 | 4.6532 | 99 |
| 33-26.50 | 605 635 13928 | 50 | 33 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 127 | 33 | 15 | 7 | 5 | 64 | 4.4962 | 35 |
| 33-26.71 | 637 603 13736 | 71 | 33 | 0 | 0 | 0 | 12 | 0 | 18 | 0 | 18 | 0 | 12 | 0 | 0 | 0 | 1 | 0 | 127 | 33 | 15 | 25 | 6 | 67 | 4.5121 | 66 |
| 33-26.83 | 669 571 13800 | 83 | 33 | 0 | 6 | 0 | 6 | 0 | 18 | 0 | 18 | 0 | 6 | 0 | 6 | 0 | 1 | 0 | 127 | 33 | 15 | 32 | 7 | 68 | 4.5296 | 81 |
| 33-26.38 | 592 648 14048 | 38 | 32 | 0 | 0 | 1 | 0 | 6 | 0 | 48 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 1 | 8 | 7 | 4.4900 | 21 |
| 33-26.41 | 597 643 14008 | 41 | 32 | 0 | 0 | 0 | 3 | 0 | 28 | 0 | 28 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 11 | 3 | 9 | 3 | 4.4924 | 24 |

k = 33, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33-26.42c | 600 640 13952 | 42 | 32 | 0 | 0 | 0 | 0 | 16 | 0 | 30 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 10 | 4 | 11 | 1 | 4.4937 | 27 |
| 33-26.45 | 600 640 13984 | 45 | 32 | 0 | 0 | 0 | 0 | 16 | 0 | 30 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 10 | 6 | 13 | 2 | 4.4939 | 30 |
| 33-26.41 | 597 643 14008 | 41 | 32 | 0 | 0 | 0 | 3 | 0 | 28 | 0 | 28 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 11 | 3 | 9 | 3 | 4.4924 | 24 |
| 33-26.51a | 605 635 13928 | 50 | 32 | 0 | 0 | 0 | 6 | 0 | 25 | 0 | 25 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 11 | 9 | 14 | 4 | 4.4962 | 35 |
| 33-26.56b | 613 627 13912 | 56 | 32 | 0 | 0 | 0 | 9 | 0 | 22 | 0 | 22 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 11 | 13 | 19 | 5 | 4.5004 | 42 |
| 33-26.76 | 645 595 13976 | 76 | 32 | 0 | 0 | 0 | 21 | 0 | 10 | 0 | 10 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 127 | 32 | 11 | 28 | 33 | 6 | 4.5179 | 72 |
| 33-26.38 | 592 648 14048 | 38 | 32 | 0 | 0 | 1 | 0 | 6 | 0 | 48 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 1 | 8 | 7 | 4.4900 | 21 |
| 33-26.42b | 600 640 13952 | 42 | 32 | 0 | 0 | 4 | 0 | 0 | 0 | 54 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 4 | 11 | 8 | 4.4937 | 28 |
| 33-26.54a | 608 632 13920 | 54 | 32 | 0 | 0 | 2 | 0 | 14 | 0 | 30 | 0 | 14 | 0 | 2 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 12 | 16 | 9 | 4.4978 | 39 |
| 33-26.58 | 616 624 13856 | 58 | 32 | 0 | 0 | 3 | 0 | 16 | 0 | 24 | 0 | 16 | 0 | 3 | 0 | 0 | 0 | 0 | 127 | 32 | 12 | 15 | 20 | 10 | 4.5016 | 44 |

k = 33, Design generators

| Design | Design Generators |
|---|---|
| 33-26.1 | 7 11 19 29 30 35 45 46 53 54 57 58 60 67 77 86 92 97 98 100 103 104 107 112 115 125 |
| 33-26.2 | 7 11 19 29 30 35 41 42 44 47 53 54 56 59 77 82 84 88 102 104 107 112 121 122 124 127 |
| 33-26.3 | 7 11 19 29 30 35 45 46 53 54 57 58 60 67 86 92 95 97 98 100 103 104 107 112 115 125 |
| 33-26.4 | 7 11 19 29 30 35 45 46 53 54 57 58 60 63 67 77 86 97 98 100 103 104 107 112 115 125 |
| 33-26.5 | 7 11 13 14 19 21 22 25 26 28 35 41 42 52 61 67 73 84 87 93 101 102 108 111 114 120 |
| 33-26.6 | 7 11 13 14 19 21 22 25 26 28 35 41 42 52 61 67 73 84 87 93 101 108 111 113 114 120 |
| 33-26.7 | 7 11 13 14 19 21 22 25 26 28 35 41 42 52 61 67 73 74 84 93 101 102 108 111 114 120 |
| 33-26.8 | 7 11 19 29 30 35 45 46 53 54 57 58 60 67 77 86 89 97 98 100 103 104 107 112 115 125 |
| 33-26.9 | 7 11 19 29 30 35 45 46 53 54 57 58 60 67 77 86 90 97 98 100 103 104 107 112 115 125 |
| 33-26.10 | 7 11 19 29 30 35 41 42 44 47 53 54 56 59 82 84 88 91 102 104 107 112 121 122 124 127 |
| 33-26.11 | 7 11 13 14 19 21 22 25 26 28 35 41 42 52 61 67 73 74 84 93 101 108 113 114 120 123 |
| 33-26.12 | 7 11 13 14 19 21 22 25 26 28 35 41 42 52 55 61 67 73 74 84 93 101 102 108 114 120 |
| 33-26.13 | 7 11 13 14 19 21 22 25 26 28 35 41 42 52 55 61 67 73 74 84 93 101 108 113 114 120 |
| 33-26.14 | 7 11 19 29 30 35 37 38 41 42 49 50 67 69 70 76 79 84 104 107 112 115 121 122 124 127 |
| 33-26.15 | 7 13 19 21 22 25 28 35 37 38 44 49 50 52 55 56 69 75 78 81 84 95 97 112 123 126 |
| 33-26.16a | 7 13 19 21 22 25 28 35 37 38 41 49 50 52 55 56 69 75 78 81 84 95 97 106 112 126 |
| 33-26.16b | 7 13 19 21 22 25 28 35 37 38 44 49 50 52 55 56 69 75 78 81 84 95 97 106 112 126 |
| 33-26.18 | 7 13 19 21 22 25 28 35 37 38 44 49 50 52 55 56 69 75 78 81 84 90 95 97 112 126 |
| 33-26.19 | 7 13 19 21 22 25 28 35 37 38 41 49 50 52 55 56 69 75 78 81 84 90 95 97 112 126 |
| 33-26.20 | 7 13 19 21 22 25 28 35 37 38 49 50 52 55 56 69 75 78 81 84 95 97 100 106 112 126 |
| 33-26.24 | 7 11 19 29 38 41 42 47 49 56 62 70 73 82 87 88 94 101 104 107 112 115 121 122 124 127 |
| 33-26.29 | 7 11 19 29 30 35 37 38 41 42 44 47 67 73 74 76 79 88 104 107 112 115 121 122 124 127 |
| 33-26.38 | 7 11 13 14 19 28 31 35 38 42 49 50 52 59 67 76 79 85 98 104 107 109 112 121 122 124 |
| 33-26.39 | 7 13 19 21 22 25 35 37 38 49 50 52 55 56 67 69 81 84 95 97 100 106 111 112 117 126 |
| 33-26.41 | 7 11 13 14 19 25 28 31 35 38 42 49 50 52 59 67 79 85 98 104 107 109 112 121 122 124 |
| 33-26.42a | 7 11 19 30 38 41 44 49 52 59 61 70 74 79 82 87 91 93 104 107 112 115 121 122 124 127 |
| 33-26.42b | 7 11 21 22 31 35 38 41 56 59 67 77 81 84 87 94 97 98 103 104 112 115 121 122 124 127 |
| 33-26.42c | 7 11 19 21 22 25 31 35 38 47 49 56 59 61 67 78 82 84 98 100 103 107 112 121 122 124 |
| 33-26.45 | 7 11 13 14 19 25 28 31 35 38 42 49 50 52 59 62 67 79 85 98 104 109 112 121 122 124 |
| 33-26.50 | 7 11 21 25 28 31 35 50 52 56 61 69 76 86 88 91 97 103 104 109 112 115 121 122 124 127 |
| 33-26.51a | 7 19 22 29 35 37 38 41 42 44 50 67 69 73 76 82 87 91 104 107 112 115 121 122 124 127 |
| 33-26.51b | 7 11 13 14 19 25 28 31 35 38 49 50 52 56 59 67 79 85 98 104 107 112 121 122 124 127 |
| 33-26.53 | 7 13 19 21 22 25 35 37 38 41 49 50 52 55 56 67 69 81 84 95 97 100 111 112 117 126 |
| 33-26.54a | 7 11 19 30 35 37 41 42 44 47 56 67 69 74 76 81 87 88 104 109 112 117 121 122 124 127 |
| 33-26.54b | 7 11 13 14 19 28 31 35 38 49 50 52 56 59 67 76 79 85 98 104 107 112 121 122 124 127 |
| 33-26.56a | 7 11 19 30 35 37 41 42 44 47 56 67 74 76 81 87 88 91 104 109 112 117 121 122 124 127 |
| 33-26.56b | 7 11 19 30 35 37 38 41 42 44 47 67 69 74 76 81 87 88 104 109 112 117 121 122 124 127 |
| 33-26.58 | 7 19 21 22 25 26 31 35 38 45 49 67 69 70 73 74 82 87 91 94 97 98 112 117 121 124 |
| 33-26.59a | 7 11 19 30 35 41 42 44 47 56 59 67 74 76 81 87 88 91 104 109 112 117 121 122 124 127 |
| 33-26.59b | 7 19 21 22 25 26 31 35 38 45 49 67 69 73 74 81 82 87 91 94 97 98 107 112 117 121 |
| 33-26.61 | 7 11 19 30 35 37 41 42 44 47 56 67 69 74 76 81 87 88 104 112 115 117 121 122 124 127 |

k = 33, Design generators (Continued)

| Design | Design Generators |
|---|---|
| 33-26.62 | 7 19 22 29 35 37 38 41 42 44 47 67 73 74 76 82 88 91 104 107 112 115 121 122 124 127 |
| 33-26.63 | 7 11 19 30 35 41 42 44 47 56 59 67 69 74 76 81 87 88 104 112 115 117 121 122 124 127 |
| 33-26.64 | 7 11 19 30 35 37 38 41 42 44 47 67 74 76 81 87 88 91 104 109 112 117 121 122 124 127 |
| 33-26.66 | 7 11 19 30 35 37 41 42 44 47 56 67 69 74 81 82 87 88 104 110 115 117 121 122 124 127 |
| 33-26.68 | 7 11 13 21 25 28 31 35 41 59 69 76 86 88 97 98 100 103 104 107 110 112 115 121 122 124 |
| 33-26.69 | 7 11 19 30 35 37 41 42 44 47 56 69 74 81 82 87 88 93 104 110 115 117 121 122 124 127 |
| 33-26.71 | 7 11 13 14 19 21 22 26 35 37 38 49 50 56 59 67 69 70 81 82 88 91 111 112 115 118 |
| 33-26.73 | 7 11 19 30 35 37 41 42 44 47 56 67 69 74 81 82 87 88 104 112 115 117 121 122 124 127 |
| 33-26.75 | 7 11 19 30 35 37 41 42 44 47 56 67 69 74 81 82 87 88 104 107 112 115 121 122 124 127 |
| 33-26.76 | 7 11 19 30 35 37 38 41 42 44 47 69 74 81 82 87 88 93 104 110 115 117 121 122 124 127 |
| 33-26.78 | 7 11 19 30 35 37 41 42 44 47 56 69 74 81 82 87 88 93 104 112 115 117 121 122 124 127 |
| 33-26.79 | 7 11 19 30 35 37 41 42 44 47 56 67 69 81 82 84 87 88 104 110 115 117 121 122 124 127 |
| 33-26.81 | 7 11 19 30 35 37 41 42 44 47 56 69 81 82 84 87 88 93 104 110 115 117 121 122 124 127 |
| 33-26.83 | 7 11 19 30 35 37 41 42 44 47 56 67 69 81 82 84 87 88 104 112 115 117 121 122 124 127 |
| 33-26.84 | 7 11 19 30 35 37 41 42 44 47 56 67 69 81 82 84 87 88 104 107 112 115 121 122 124 127 |
| 33-26.85 | 7 11 19 30 35 37 38 41 42 44 47 69 74 81 82 87 88 93 104 112 115 117 121 122 124 127 |
| 33-26.86 | 7 11 19 30 35 37 38 41 42 44 47 69 81 82 84 87 88 93 104 110 115 117 121 122 124 127 |
| 33-26.88 | 7 11 19 30 35 37 41 42 44 47 56 69 81 82 84 87 88 93 104 112 115 117 121 122 124 127 |
| 33-26.90 | 7 11 19 30 35 37 41 42 44 47 56 67 81 82 84 87 88 91 104 107 112 115 121 122 124 127 |
| 33-26.92 | 7 11 19 30 35 37 38 41 42 44 47 69 81 82 84 87 88 93 104 112 115 117 121 122 124 127 |
| 33-26.94 | 7 11 19 30 35 37 41 42 44 47 56 81 82 84 87 88 91 93 104 112 115 117 121 122 124 127 |
| 33-26.96 | 7 11 19 30 35 37 38 41 42 44 47 81 82 84 87 88 91 93 104 112 115 117 121 122 124 127 |
| 33-26.99 | 7 19 21 22 35 37 38 49 50 52 56 67 69 70 81 82 84 88 97 98 100 111 112 115 117 118 |
| 33-26.101 | 7 19 21 22 35 37 38 49 50 52 55 67 69 70 81 82 84 87 97 98 100 111 112 115 117 118 |

k = 34, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 34-27.1 | 589 1800 10788 | 1 | 0 | 0 | 0 | 0 | 24 | 50 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 121 | 0 | 15 | 11 | 1 | 4.1085 | 2 |
| 34-27.2 | 589 1801 10788 | 2 | 0 | 0 | 0 | 0 | 24 | 50 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 121 | 0 | 15 | 12 | 2 | 4.1086 | 3 |
| 34-27.3 | 597 1764 10882 | 3 | 0 | 0 | 0 | 4 | 28 | 31 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 121 | 0 | 15 | 13 | 3 | 4.1111 | 4 |
| 34-27.4 | 598 1764 10868 | 4 | 0 | 0 | 0 | 6 | 24 | 33 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 121 | 0 | 16 | 14 | 10 | 4.1116 | 5 |
| 34-27.5 | 605 1728 10978 | 5 | 0 | 0 | 0 | 12 | 12 | 48 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 121 | 0 | 15 | 15 | 4 | 4.1138 | 6 |
| 34-27.6 | 605 1728 10979 | 6 | 0 | 0 | 0 | 12 | 12 | 48 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 121 | 0 | 15 | 16 | 5 | 4.1138 | 7 |
| 34-27.7 | 606 1728 10964 | 7 | 0 | 0 | 0 | 14 | 8 | 50 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 1 | 0 | 121 | 0 | 16 | 17 | 11 | 4.1142 | 8 |
| 34-27.8 | 607 1715 11046 | 8 | 0 | 0 | 0 | 15 | 17 | 21 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 121 | 0 | 15 | 18 | 6 | 4.1144 | 9 |
| 34-27.9 | 608 1728 10936 | 9 | 0 | 0 | 0 | 18 | 0 | 54 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 1 | 121 | 0 | 17 | 19 | 22 | 4.1152 | 10 |
| 34-27.10 | 615 1680 11146 | 10 | 0 | 0 | 2 | 11 | 25 | 18 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 121 | 0 | 15 | 20 | 7 | 4.1171 | 11 |
| 34-27.11 | 616 1280 14432 | 11 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 127 | 0 | 17 | 1 | 23 | 4.1081 | 1 |
| 34-27.12 | 616 1680 11132 | 12 | 0 | 0 | 4 | 7 | 27 | 18 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 121 | 0 | 16 | 21 | 12 | 4.1176 | 12 |
| 34-27.13 | 634 1600 11412 | 13 | 0 | 1 | 5 | 2 | 48 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 121 | 0 | 16 | 22 | 13 | 4.1239 | 14 |
| 34-27.14 | 636 1600 11384 | 14 | 0 | 4 | 0 | 3 | 49 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3 | 0 | 121 | 0 | 16 | 23 | 14 | 4.1248 | 17 |
| 34-27.15 | 637 1568 11578 | 15 | 0 | 0 | 8 | 24 | 0 | 7 | 33 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 121 | 0 | 15 | 24 | 8 | 4.1242 | 15 |
| 34-27.16 | 638 1568 11564 | 16 | 0 | 0 | 8 | 24 | 0 | 7 | 33 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3 | 0 | 121 | 0 | 16 | 25 | 15 | 4.1247 | 16 |
| 34-27.17 | 645 1536 11691 | 17 | 0 | 0 | 8 | 24 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 121 | 0 | 15 | 26 | 9 | 4.1272 | 18 |
| 34-27.18a | 646 1536 11676 | 18 | 0 | 2 | 4 | 26 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 1 | 0 | 121 | 0 | 16 | 27 | 16 | 4.1277 | 19 |
| 34-27.18b | 646 1536 11676 | 18 | 0 | 0 | 8 | 24 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 3 | 0 | 121 | 0 | 16 | 27 | 16 | 4.1277 | 19 |
| 34-27.20 | 648 1536 11648 | 20 | 0 | 4 | 0 | 28 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 1 | 121 | 0 | 17 | 29 | 24 | 4.1286 | 21 |

k = 34, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 34-27.11 | 616 1280 14432 | 11 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 127 | 0 | 17 | 1 | 23 | 4.1081 | 1 |
| 34-27.21 | 656 1200 14184 | 21 | 0 | 32 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 127 | 0 | 17 | 2 | 25 | 4.1238 | 13 |
| 34-27.23 | 680 1152 14240 | 23 | 0 | 32 | 0 | 12 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 1 | 127 | 0 | 17 | 3 | 26 | 4.1342 | 22 |
| 34-27.26 | 720 1072 14504 | 26 | 0 | 38 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 6 | 0 | 0 | 1 | 127 | 0 | 17 | 4 | 28 | 4.1525 | 26 |
| 34-27.31 | 976 560 19880 | 31 | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 1 | 127 | 0 | 17 | 5 | 31 | 4.2919 | 31 |
| 34-27.22 | 674 1424 12740 | 22 | 0 | 0 | 16 | 44 | 0 | 0 | 0 | 0 | 0 | 19 | 9 | 0 | 0 | 0 | 0 | 3 | 0 | 125 | 0 | 16 | 6 | 18 | 4.1410 | 24 |
| 34-27.24 | 680 1408 12704 | 24 | 0 | 8 | 0 | 52 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 4 | 0 | 0 | 0 | 2 | 1 | 125 | 0 | 17 | 7 | 27 | 4.1431 | 25 |
| 34-27.27 | 730 1200 13972 | 27 | 0 | 3 | 33 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 4 | 0 | 0 | 0 | 3 | 0 | 125 | 0 | 16 | 8 | 20 | 4.1639 | 28 |
| 34-27.29 | 794 1008 15316 | 29 | 0 | 3 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 3 | 0 | 125 | 0 | 16 | 9 | 21 | 4.1941 | 29 |
| 34-27.30 | 808 896 15904 | 30 | 0 | 32 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 2 | 1 | 125 | 0 | 17 | 10 | 30 | 4.1975 | 30 |

k = 34, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,...) | | | wlp rank | alp | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 34-27.1 | 589 | 1800 | 10788 | 1 | 0 | 0 | 0 | 0 | 24 | 50 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 121 | 0 | 15 | 11 | 1 | 4.1085 | 2 |
| 34-27.2 | 589 | 1801 | 10788 | 2 | 0 | 0 | 0 | 0 | 24 | 50 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 121 | 0 | 15 | 12 | 2 | 4.1086 | 3 |
| 34-27.3 | 597 | 1764 | 10882 | 3 | 0 | 0 | 0 | 4 | 28 | 31 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 0 | 121 | 0 | 15 | 13 | 3 | 4.1111 | 4 |
| 34-27.5 | 605 | 1728 | 10978 | 5 | 0 | 0 | 0 | 12 | 12 | 48 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 121 | 0 | 15 | 15 | 4 | 4.1138 | 6 |
| 34-27.6 | 605 | 1728 | 10979 | 6 | 0 | 0 | 0 | 12 | 12 | 48 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 121 | 0 | 15 | 16 | 5 | 4.1138 | 7 |
| 34-27.8 | 607 | 1715 | 11046 | 8 | 0 | 0 | 0 | 15 | 17 | 21 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 121 | 0 | 15 | 18 | 6 | 4.1144 | 9 |
| 34-27.10 | 615 | 1680 | 11146 | 10 | 0 | 0 | 2 | 11 | 25 | 18 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 121 | 0 | 15 | 20 | 7 | 4.1171 | 11 |
| 34-27.15 | 637 | 1568 | 11578 | 15 | 0 | 0 | 8 | 24 | 0 | 7 | 33 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 121 | 0 | 15 | 24 | 8 | 4.1242 | 15 |
| 34-27.17 | 645 | 1536 | 11691 | 17 | 0 | 0 | 8 | 24 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 121 | 0 | 15 | 26 | 9 | 4.1272 | 18 |
| 34-27.4 | 598 | 1764 | 10868 | 4 | 0 | 0 | 0 | 6 | 24 | 33 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 121 | 0 | 16 | 14 | 10 | 4.1116 | 5 |

k = 34, Design generators

| Design | Design Generators |
|---|---|
| 34-27.1 | 7 11 19 29 30 35 45 46 53 54 57 58 60 67 77 86 89 92 97 98 100 103 104 107 112 115 125 |
| 34-27.2 | 7 11 19 29 30 35 45 46 53 54 57 58 60 63 67 77 86 89 97 98 100 103 104 107 112 115 125 |
| 34-27.3 | 7 11 13 14 19 21 22 25 26 28 35 41 42 52 55 61 67 73 74 84 93 101 102 108 111 114 120 |
| 34-27.4 | 7 11 13 14 19 21 22 25 26 28 35 41 42 52 55 61 67 73 74 84 93 101 108 113 114 120 123 |
| 34-27.5 | 7 13 19 21 22 25 28 35 37 38 44 49 50 52 55 56 69 75 78 81 84 95 97 106 111 112 126 |
| 34-27.6 | 7 13 19 21 22 25 28 35 37 38 44 49 50 52 55 56 69 75 78 81 84 90 95 97 112 123 126 |
| 34-27.7 | 7 13 19 21 22 25 28 35 37 38 41 49 50 52 55 56 69 75 78 81 84 90 95 97 106 112 126 |
| 34-27.8 | 7 11 13 14 19 21 22 25 26 28 35 41 42 52 55 61 67 73 74 84 87 93 101 102 108 114 120 |
| 34-27.9 | 7 13 19 21 22 25 28 35 37 38 41 49 50 52 55 56 69 75 78 81 84 90 95 97 111 112 126 |
| 34-27.10 | 7 13 19 21 22 25 28 35 37 38 41 44 49 50 52 55 56 69 75 78 81 84 95 97 106 112 126 |
| 34-27.11 | 7 11 19 29 30 35 37 38 41 42 49 50 67 69 70 76 79 84 87 104 107 112 115 121 122 124 127 |
| 34-27.12 | 7 13 19 21 22 25 28 35 37 38 41 44 49 50 52 55 56 69 75 78 81 84 90 95 97 112 126 |
| 34-27.13 | 7 13 19 21 22 25 28 35 37 38 49 50 52 55 56 69 75 78 81 84 95 97 100 106 112 117 126 |
| 34-27.14 | 7 13 19 21 22 25 28 35 37 38 49 50 52 55 56 69 75 78 81 84 90 95 97 100 112 117 126 |
| 34-27.15 | 7 13 19 21 22 25 28 35 37 38 41 44 49 50 52 55 56 69 75 78 81 84 95 97 100 112 126 |
| 34-27.16 | 7 13 19 21 22 25 28 35 37 38 41 44 49 50 52 55 56 69 75 81 84 95 97 100 106 112 126 |
| 34-27.17 | 7 13 19 21 22 25 28 35 37 38 41 44 49 50 52 55 56 61 69 75 81 84 95 97 112 123 126 |
| 34-27.18a | 7 13 19 21 22 25 28 35 37 38 41 44 49 50 52 55 56 61 69 75 78 81 84 95 97 112 126 |
| 34-27.18b | 7 13 19 21 22 25 28 35 37 38 41 44 49 50 52 55 56 61 69 75 81 84 95 97 106 112 126 |
| 34-27.20 | 7 13 19 21 22 25 28 35 37 38 41 44 49 50 52 55 56 61 69 78 81 84 95 97 111 112 126 |
| 34-27.21 | 7 11 19 29 30 35 37 38 41 42 44 47 67 73 74 76 79 88 91 104 107 112 115 121 122 124 127 |
| 34-27.22 | 7 19 21 22 25 35 37 38 41 49 50 52 55 56 67 69 78 81 82 84 95 97 98 100 111 112 126 |
| 34-27.23 | 7 11 14 19 22 25 26 28 31 45 53 56 67 70 88 91 94 97 98 100 103 104 112 121 122 124 127 |
| 34-27.24 | 7 19 21 22 25 35 37 38 41 49 50 52 55 56 67 69 78 81 82 84 95 97 98 111 112 115 126 |
| 34-27.26 | 7 13 19 21 22 25 35 37 38 41 44 49 50 52 55 56 67 69 81 84 95 97 98 100 112 117 126 |
| 34-27.27 | 7 19 21 22 25 35 37 38 41 49 50 52 55 56 67 69 78 81 82 84 95 97 98 100 112 115 126 |
| 34-27.29 | 7 19 21 22 25 35 37 38 49 50 52 55 56 67 69 78 81 82 84 95 97 98 100 112 115 117 126 |
| 34-27.30 | 7 19 21 22 25 35 37 38 41 49 50 52 55 56 67 69 81 82 84 95 97 98 100 112 115 117 126 |
| 34-27.31 | 7 19 21 30 35 37 38 44 49 52 55 58 67 69 70 81 82 84 87 97 98 100 103 112 115 117 118 |

k = 35, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35-28.1 | 665 2100 13020 | 1 | 0 | 0 | 0 | 0 | 0 | 70 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 122 | 0 | 15 | 3 | 1 | 3.7764 | 1 |
| 35-28.2 | 665 2101 13020 | 2 | 0 | 0 | 0 | 0 | 0 | 70 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 122 | 0 | 15 | 4 | 2 | 3.7764 | 2 |
| 35-28.3 | 674 2058 13140 | 3 | 0 | 0 | 0 | 0 | 18 | 35 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 122 | 0 | 16 | 5 | 3 | 3.7790 | 3 |
| 35-28.4 | 683 2016 13263 | 4 | 0 | 0 | 0 | 4 | 16 | 36 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 122 | 0 | 16 | 6 | 4 | 3.7816 | 4 |
| 35-28.5 | 684 2016 13248 | 5 | 0 | 0 | 0 | 6 | 12 | 38 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 122 | 0 | 17 | 7 | 8 | 3.7820 | 5 |
| 35-28.6 | 694 1960 13468 | 6 | 0 | 0 | 0 | 10 | 22 | 7 | 33 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 122 | 0 | 16 | 8 | 5 | 3.7848 | 6 |
| 35-28.7 | 703 1920 13599 | 7 | 0 | 0 | 2 | 6 | 24 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 122 | 0 | 16 | 9 | 6 | 3.7876 | 7 |
| 35-28.8 | 704 1920 13584 | 8 | 0 | 0 | 4 | 2 | 26 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 122 | 0 | 17 | 10 | 9 | 3.7880 | 8 |
| 35-28.9 | 727 1792 14127 | 9 | 0 | 0 | 4 | 28 | 0 | 0 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 122 | 0 | 16 | 11 | 7 | 3.7945 | 9 |
| 35-28.10 | 728 1792 14112 | 10 | 0 | 0 | 4 | 28 | 0 | 0 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3 | 122 | 0 | 17 | 12 | 10 | 3.7949 | 10 |
| 35-28.11 | 776 1536 15264 | 11 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 122 | 0 | 17 | 13 | 11 | 3.8090 | 11 |
| 35-28.12 | 776 1600 15712 | 12 | 0 | 0 | 8 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 4 | 0 | 0 | 0 | 0 | 3 | 126 | 0 | 17 | 1 | 12 | 3.8146 | 12 |
| 35-28.13 | 840 1344 17248 | 13 | 0 | 0 | 32 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 3 | 126 | 0 | 17 | 2 | 13 | 3.8387 | 13 |

k = 35, Designs sorted based on degrees of freedom used

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35-28.12 | 776 1600 15712 | 12 | 0 | 0 | 8 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 4 | 0 | 0 | 0 | 0 | 3 | 126 | 0 | 17 | 1 | 12 | 3.8146 | 12 |
| 35-28.13 | 840 1344 17248 | 13 | 0 | 0 | 32 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 3 | 126 | 0 | 17 | 2 | 13 | 3.8387 | 13 |
| 35-28.1 | 665 2100 13020 | 1 | 0 | 0 | 0 | 0 | 0 | 70 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 122 | 0 | 15 | 3 | 1 | 3.7764 | 1 |
| 35-28.2 | 665 2101 13020 | 2 | 0 | 0 | 0 | 0 | 0 | 70 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 122 | 0 | 15 | 4 | 2 | 3.7764 | 2 |
| 35-28.3 | 674 2058 13140 | 3 | 0 | 0 | 0 | 0 | 18 | 35 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 122 | 0 | 16 | 5 | 3 | 3.7790 | 3 |
| 35-28.4 | 683 2016 13263 | 4 | 0 | 0 | 0 | 4 | 16 | 36 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 122 | 0 | 16 | 6 | 4 | 3.7816 | 4 |
| 35-28.5 | 684 2016 13248 | 5 | 0 | 0 | 0 | 6 | 12 | 38 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 122 | 0 | 17 | 7 | 8 | 3.7820 | 5 |
| 35-28.6 | 694 1960 13468 | 6 | 0 | 0 | 0 | 10 | 22 | 7 | 33 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 122 | 0 | 16 | 8 | 5 | 3.7848 | 6 |
| 35-28.7 | 703 1920 13599 | 7 | 0 | 0 | 2 | 6 | 24 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 122 | 0 | 16 | 9 | 6 | 3.7876 | 7 |
| 35-28.8 | 704 1920 13584 | 8 | 0 | 0 | 4 | 2 | 26 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 122 | 0 | 17 | 10 | 9 | 3.7880 | 8 |

k = 35, Designs sorted based on minimizing Lmax

| Design | wlp($w_4$,…) | wlp rank | alp | | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35-28.1 | 665 2100 13020 | 1 | 0 | 0 | 0 | 0 | 0 | 70 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 122 | 0 | 15 | 3 | 1 | 3.7764 | 1 |
| 35-28.2 | 665 2101 13020 | 2 | 0 | 0 | 0 | 0 | 0 | 70 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 122 | 0 | 15 | 4 | 2 | 3.7764 | 2 |
| 35-28.3 | 674 2058 13140 | 3 | 0 | 0 | 0 | 0 | 18 | 35 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 122 | 0 | 16 | 5 | 3 | 3.7790 | 3 |
| 35-28.4 | 683 2016 13263 | 4 | 0 | 0 | 0 | 4 | 16 | 36 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 122 | 0 | 16 | 6 | 4 | 3.7816 | 4 |
| 35-28.6 | 694 1960 13468 | 6 | 0 | 0 | 0 | 10 | 22 | 7 | 33 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 122 | 0 | 16 | 8 | 5 | 3.7848 | 6 |
| 35-28.7 | 703 1920 13599 | 7 | 0 | 0 | 2 | 6 | 24 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 122 | 0 | 16 | 9 | 6 | 3.7876 | 7 |
| 35-28.9 | 727 1792 14127 | 9 | 0 | 0 | 4 | 28 | 0 | 0 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 122 | 0 | 16 | 11 | 7 | 3.7945 | 9 |
| 35-28.5 | 684 2016 13248 | 5 | 0 | 0 | 0 | 6 | 12 | 38 | 16 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 122 | 0 | 17 | 7 | 8 | 3.7820 | 5 |
| 35-28.8 | 704 1920 13584 | 8 | 0 | 0 | 4 | 2 | 26 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 1 | 122 | 0 | 17 | 10 | 9 | 3.7880 | 8 |
| 35-28.10 | 728 1792 14112 | 10 | 0 | 0 | 4 | 28 | 0 | 0 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3 | 122 | 0 | 17 | 12 | 10 | 3.7949 | 10 |

k = 35, Design generators

| Design | Design Generators |
|---|---|
| 35-28.1 | 15 23 25 26 28 39 43 45 46 51 53 54 56 71 73 74 76 81 82 84 88 99 101 104 111 112 119 126 |
| 35-28.2 | 15 23 25 26 28 39 43 45 46 51 53 54 56 71 73 74 76 81 82 84 88 101 104 111 112 119 123 126 |
| 35-28.3 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 74 76 81 82 84 88 101 104 111 112 119 126 |
| 35-28.4 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 76 81 82 84 88 95 101 104 111 112 119 126 |
| 35-28.5 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 74 81 82 84 88 95 101 104 112 119 123 125 126 |
| 35-28.6 | 15 23 25 26 28 39 43 45 46 51 54 56 63 71 73 76 81 82 84 88 95 99 101 104 112 119 123 126 |
| 35-28.7 | 15 23 25 26 28 39 43 45 46 51 54 56 63 71 73 76 81 82 84 88 95 101 102 104 111 112 119 126 |
| 35-28.8 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 74 81 82 84 88 95 101 104 111 112 119 125 126 |
| 35-28.9 | 15 23 27 29 30 41 42 44 51 53 54 56 63 67 69 73 86 90 92 95 97 104 107 109 114 116 121 126 |
| 35-28.10 | 15 23 27 29 30 41 42 44 51 53 54 63 67 69 73 86 90 92 95 97 102 104 107 109 114 116 121 126 |
| 35-28.11 | 15 23 27 29 30 37 43 44 51 52 58 63 69 70 75 76 83 84 90 95 97 100 104 111 112 119 123 126 |
| 35-28.12 | 15 23 25 30 39 41 46 51 53 54 56 63 71 73 78 83 85 86 88 95 97 98 100 104 111 112 121 126 |
| 35-28.13 | 15 23 25 30 39 41 42 44 49 54 56 63 71 75 77 78 81 86 88 95 99 102 104 111 112 119 121 126 |

k = 36, Designs sorted based on word length pattern

| Design | wlp($W_4$,...) | wlp rank | alp | | | | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36-29.1 | 756 2401 15736 | 1 | 0 | 0 | 0 | 0 | 0 | 42 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | | 123 | 0 | 16 | 2 | 1 | 1 | 3.4811 | 1 |
| 36-29.2 | 766 2352 15890 | 2 | 0 | 0 | 0 | 0 | 12 | 27 | 33 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | | 123 | 0 | 17 | 3 | 2 | 2 | 3.4837 | 2 |
| 36-29.3 | 776 2304 16048 | 3 | 0 | 0 | 0 | 4 | 4 | 48 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | | 123 | 0 | 17 | 4 | 3 | 3 | 3.4864 | 3 |
| 36-29.4 | 777 2304 16032 | 4 | 0 | 0 | 0 | 6 | 0 | 50 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | | 123 | 0 | 18 | 5 | 4 | 6 | 3.4867 | 4 |
| 36-29.5 | 788 2240 16300 | 5 | 0 | 0 | 0 | 5 | 27 | 0 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | | 123 | 0 | 17 | 6 | 5 | 4 | 3.4894 | 5 |
| 36-29.6 | 824 2048 17104 | 6 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | | 123 | 0 | 17 | 7 | 6 | 5 | 3.4987 | 6 |
| 36-29.7 | 825 2048 17088 | 7 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3 | | 123 | 0 | 18 | 8 | 7 | 7 | 3.4991 | 7 |
| 36-29.8 | 889 1792 19264 | 8 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 3 | | 127 | 0 | 18 | 1 | 8 | 8 | 3.5229 | 8 |

k = 36, Design generators

| Design | Design Generators |
|---|---|
| 36-29.1 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 74 76 81 82 84 88 99 101 104 111 112 119 126 |
| 36-29.2 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 74 76 81 82 84 88 95 101 104 111 112 119 126 |
| 36-29.3 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 76 81 82 84 88 95 101 102 104 111 112 119 126 |
| 36-29.4 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 74 81 82 84 88 95 101 104 111 112 119 123 125 126 |
| 36-29.5 | 15 23 25 26 28 39 43 45 46 51 54 56 63 71 73 76 81 82 84 88 95 99 101 102 104 112 119 123 126 |
| 36-29.6 | 15 23 27 29 30 41 42 44 51 53 54 56 63 67 69 73 86 90 92 95 97 104 107 109 114 116 119 121 126 |
| 36-29.7 | 15 23 27 29 30 41 42 44 51 53 54 63 67 69 73 86 90 92 95 97 102 104 107 109 114 116 119 121 126 |
| 36-29.8 | 15 23 25 30 39 41 46 51 53 54 56 63 71 73 78 83 85 86 88 95 97 98 100 104 111 112 119 121 126 |

k = 37, Designs sorted based on word length pattern

| Design | wlp($w_4$,...) | wlp rank | alp | | | | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | C2FI rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37-30.1 | 854 2744 18886 | 1 | 0 | 0 | 0 | 0 | 0 | 21 | 51 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | | 124 | 0 | 17 | 1 | 1 | 1 | 3.2166 | 1 |
| 37-30.2 | 865 2688 19080 | 2 | 0 | 0 | 0 | 0 | 6 | 26 | 24 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | | 124 | 0 | 18 | 2 | 2 | 2 | 3.2191 | 2 |
| 37-30.3 | 889 2560 19584 | 3 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | | 124 | 0 | 18 | 3 | 3 | 3 | 3.2246 | 3 |

k = 37, Design generators

| Design | Design Generators |
|---|---|
| 37-30.1 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 74 76 81 82 84 88 95 99 101 104 111 112 119 126 |
| 37-30.2 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 74 76 81 82 84 88 95 101 102 104 111 112 119 126 |
| 37-30.3 | 15 23 25 26 28 39 43 45 46 51 54 56 63 71 73 76 81 82 84 88 95 99 101 102 104 111 112 119 123 126 |

k = 38, Designs sorted based on word length pattern

| Design | wlp($w_4$,...) | wlp rank | alp | | | | | | | | | | | | | | | | | | | df | C2FI | Lmax | df rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38-31.1 | 959 3136 22512 | 1 | 0 | 0 | 0 | 0 | 0 | 7 | 49 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 125 | 0 | 18 | 1 | 1 | 2.9795 | 1 |
| 38-31.2 | 971 3072 22752 | 2 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 125 | 0 | 19 | 2 | 2 | 2.9819 | 2 |

k = 38, Design generators

| Design | Design Generators |
|---|---|
| 38-31.1 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 126 |
| 38-31.2 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 74 76 81 82 84 88 95 101 102 104 111 112 119 125 126 |

k = 39, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | df | C2FI | Lmax | df rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|
| 39-32.1 | 1071 3584 26656 | 1 | 0 0 0 0 0 0 32 48 0 0 0 0 0 0 0 0 0 0 7 | 126 | 0 | 19 | 1 | 1 | 2.7671 | 1 |

k = 39, Design generators

| Design | Design Generators |
|---|---|
| 39-32.1 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 126 |

k = 40, Designs sorted based on word length pattern

| Design | wlp($w_4$,…) | wlp rank | alp | df | C2FI | Lmax | df rank | Lmax rank | CD2* | CD2 rank |
|---|---|---|---|---|---|---|---|---|---|---|
| 40-33.1 | 1190 4096 31360 | 1 | 0 0 0 0 0 0 0 80 0 0 0 0 0 0 0 0 0 0 0 7 | 127 | 0 | 20 | 1 | 1 | 2.5767 | 1 |

k = 40, Design generators

| Design | Design Generators |
|---|---|
| 40-33.1 | 15 23 25 26 28 39 43 45 46 51 53 54 56 63 71 73 74 76 81 82 84 88 95 99 101 102 104 111 112 119 123 125 126 |

## Vita

Robert M. Block is a 1987 National Merit Scholar. He graduated with Military Distinction from the United States Air Force Academy with a Bachelor of Science in Operations Research. He earned a Master of Science in Operations Research from the Industrial and Systems Engineering College at Georgia Tech. He received his Doctorate in Business Administration with a concentration in Statistics from the University of Tennessee, Knoxville.

Rob has experience as a Logistics Operations Research Analyst, and as a Financial Analyst. He has worked as a Logistics Research Analyst for Air Force Materiel Command Headquarters in Dayton, Ohio, as the Chief of Financial Analysis for the 39$^{th}$ Wing, Incirlik AB, Turkey, and as an Assistant Professor and Course Director in the Math Department at the United States Air Force Academy. He has been a command briefer for Air Force Materiel Command, and a Technical Editor for the Air Force Scientific Advisory Board.

Rob is a Distinguished Graduate from the Air Force Financial Management (Analysis) Officer Course, a Chief of Staff Award Winner at Squadron Officer School, and was named the 1997 USAFE Financial Analysis Officer of the Year. He was awarded the 1998 Distinguished Performance in Budgeting from the American Society of Military Comptrollers. He was honored as the 1999 Company Grade Officer of the Year for the Academy Math Department. He has also received the University of Tennessee's 2003 Provost award for Extraordinary Professional Promise. He has been awarded the Air Force Meritorious Service Medal with two oak leaf clusters.